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# Proposed Method for Military Intelligence Job Ability Assessment

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<p>In 1987, the U.S. Army Intelligence Center and School (USAICS) requested that the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) investigate a number of military occupational specialty (MOS) issues related to the development and introduction of new intelligence/electronic warfare (IEW) collection and processing systems. One problem is the need to develop an in-depth taxonomy that can identify and assess the abilities and skills associated with military intelligence (MI) MOS and new IEW systems, in short a "Job Abilities Assessment System (JAAS)."</p> <p>Based on the Manual of Ability Requirements Scales (MARS), the JAAS method described here can evaluate 52 different abilities and skills appropriate to MI jobs and tasks. The method was applied by 13 raters to two MI MOS: 96H (Aerial Intelligence Specialist) and 97E (Interrogator) and demonstrated high inter-rater reliability and coherent profile patterns. Further, the method was used to assess abilities and skills requirements for the Unmanned Aerial Vehicle (UAV).</p>				
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# PROPOSED METHOD FOR MILITARY INTELLIGENCE JOB ABILITY ASSESSMENT

## EXECUTIVE SUMMARY

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### Requirement:

In 1987, the U.S. Army Intelligence Center and School (USAICS) requested that the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) investigate a number of military occupational specialty (MOS) issues related to the development and introduction of new intelligence/electronic warfare (IEW) collection and processing systems. There has been a need to develop an in-depth taxonomy that can be used to identify and determine the suitability of the skills and abilities associated with military intelligence (MI) MOS and IEW systems.

### Procedure:

One method for identifying skills and abilities associated with MOS and IEW systems is based on the Manual of Ability Requirements Scales (MARS) developed by E. A. Fleishman and his associates. In the 1984 version of MARS, 52 different abilities were defined. To identify abilities requirements in new systems and ability capabilities in MOS, a flow diagram technique was expanded from 40 to the complete set of 52 abilities. To identify how much of an ability is needed, an existing MARS scalar measurement method was adopted and extended. These two instruments, designated as the "Job Abilities Assessment System" or JAAS, were applied by 13 raters to MOS 96H (Aerial Intelligence Specialist) and MOS 97E (Interrogator). A JAAS analysis was also made of the abilities demands for operations and launch and recovery of the Unmanned Aerial Vehicle (UAV).

### Findings:

The test applications of JAAS to two MI MOS and one IEW system indicated that JAAS can be used in the MI context as it has been in other military job and task settings. Refinements in both the identification and the scaling parts of JAAS were specified.

#### Utilization of Findings:

The revised JAAS technique can potentially be used for determining the suitability of MI MOS to meet the ability and skill requirements associated with new IEW systems. JAAS can produce ability profiles of MOS, identify ability and skill requirements associated with new IEW systems, and permit an assessment in the same dimensions of the match between MOS and new systems. JAAS data are also useful for job redesign, development of training requirements, and establishment of new selection criteria.

# PROPOSED METHOD FOR MILITARY INTELLIGENCE JOB ABILITY ASSESSMENT

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# PROPOSED METHOD FOR MILITARY INTELLIGENCE JOB ABILITY ASSESSMENT

## Introduction

In earlier work, an initial model of a military intelligence (MI) military occupational specialty (MOS) taxonomy was developed (Muckler, Seven, and Akman, 1989). The purpose of developing that taxonomy was to formulate an analytical framework which potentially could be used to assess the capabilities of soldiers with specific MI MOSSs as well as to determine the requirements for skills and abilities associated with intelligence/electronic warfare (IEW) systems.

This research note describes a technique which may be used to convert and integrate IEW system demands into the MI MOS taxonomy. The work is part of a research effort focusing on the development of methodologies and techniques which can be used to determine the suitability of MI MOSSs to meet future IEW system demands.

## Background

In 1987, the U.S. Army Intelligence Center and School (USAICS) requested that ARI investigate a number of MOS issues arising from the development and introduction of new IEW collection and processing systems. An important component of this research is the development of a taxonomy of the parameters critical for evaluating each MI MOS and career management field (CMF).

In previous work, an initial MI MOS taxonomy was developed which included descriptors at three major levels: job-level variables, MOS-level variables, and CMF-level variables. These levels assume a sequential process that starts with micro-level evaluation of the impact of job changes on soldier's tasks and leads to macro-level evaluation where the impact on MOS aggregates and CMF can be measured.

Of the many dimensions included in the initial taxonomy, those concerning abilities and skills map most directly to the issues associated with the psychological descriptors which are critical elements in establishing the suitability of existing MOSSs to meet future IEW system demands. These dimensions, of the many included in the initial taxonomy, also pose more difficulty with respect to their application and measurement in manpower, personnel, and training (MPT) analysis.

## Objective

The objective of the current research is to refine a method to determine the abilities and skills represented by MOSSs and



potentially required for the operation and maintenance of IEW systems. This method for identifying and scaling abilities and skills, which is based on work by E.A. Fleishman, is here called the Job Abilities Assessment System (JAAS).

JAAS in its present form is a research product requiring testing, evaluation, and refinement before operational use can be recommended. In the present instance, the focus is on its use in determining the ability and skill requirements associated with IEW systems. Its development and application, at this stage, is part of an evolutionary process.

The present formulation of JAAS was used experimentally to assess its effectiveness. Test applications were made to specific IEW systems as well as to MI MOSSs of the 96 CMF. At each stage of its application, the results were evaluated to determine the reliability of its use in identifying and scaling abilities and skills.

Initial applications were performed by project team personnel representing a variety of different backgrounds including research psychology, MPT analysis, and Army personnel planning. The results of these limited applications are presented in a subsequent chapter, and the results were used to refine JAAS.

The modified JAAS will then be made available to subject matter experts (SME) representing MOSSs in the 96 CMF and IEW system development. The objective of these test applications, in addition to refining and validating JAAS, is to create catalogues of the ability and skill attributes associated with the 96 CMF MOSSs, including:

- 96B Intelligence Analyst
- 96D Imagery Analyst
- 96H Aerial Intelligence Specialist
- 96R Ground Surveillance Systems Operator
- 97B Counterintelligence Agent
- 97E Interrogator
- 97G Counter-Signals Intelligence Specialist.

In addition, the ability and skill requirements associated with four emerging IEW systems will also be catalogued. The following IEW system requirements will be identified:

- Joint Surveillance/Target Acquisition Radar (JSTARS)
- Unmanned Aerial Vehicle (UAV)
- Imagery Processing and Dissemination System (IPDS)
- Commander's Tactical Terminal (CTT).

The results of the JAAS application will set the stage for additional research aimed at developing methods for determining whether the MOS and IEW abilities profiles are compatible and, if

not, indicating possible approaches for aligning capabilities and requirements for more effective man-machine systems.

In sum, under this current effort, JAAS will be the focus of test applications, analysis, and refinement in order to determine whether its decision flow diagrams and scalar techniques can be used to assess the suitability of MI MOS capabilities in meeting IEW system demands.

## **JAAS Method for Assessment of MOS Capabilities and IEW System Requirements**

### **Generating New Systems MOS Requirements**

As new IEW systems evolve, there is a corresponding need to establish the MPT consequences of the new tasks that the IEW systems will bring to system operators and maintainers. New technology does not necessarily demand new tasks. There may be modifications of old tasks, slight and insignificant shifts in task, or no apparent change in personnel task demands. On the other hand, the tasks may change so radically that previous MOS designations may no longer be appropriate.

Methodologically, what is needed is to predict the task and job demands of the new IEW system so that these demands can be compared with the characteristics of the present soldier force. To do that, one immediate need is to specify the dimensions upon which the comparisons will be made and the appropriate information that must be derived to make comparisons.

In a previous research note (Muckler, Seven, and Akman, 1989), a taxonomy was developed at several levels by which parameters were defined for comparisons of new systems against current work force capability. Of relevance here is the initial impact of the new systems on the soldier's job; these were termed "Job-Level Variables" and they are shown in Table 1. In short, these are defined as the critical parameters. These have to be defined and measured if comparisons are to be made between new and present system job and task demands.

Data on these dimensions vary in terms of their availability and the ease with which they can be extracted from a considerable variety of information sources. In some parameters, the way the dimension is measured is well-defined (e.g., 1.A.2 Physical demands) while in others (e.g., 1.B.5 Work attitudes) both the parameters and its measurement implementation are not well known. Thus, a major task at this point is to continue to explore in detail how the parameters can be measured, how pertinent data can be derived, and how those data can be used.

Of particular interest at this time is category 1.B.4 (Abilities and Skills). In short, there will be concern about the comparison of abilities and skills of the existing personnel supply and the ability and skill requirements of the new IEW systems. In what follows, the JAAS method, which can be used to extract a major part of the abilities and skills, is described.

### **Identifying Ability and Skill Requirements in IEW Systems**

The first step that must be taken is to describe the set of abilities and skills that underlie performance in MI MOSSs, as

**Table 1**

**Comparison Variables For New IEW Systems at the Job Level**

---

**I. JOB-LEVEL VARIABLES**

**A. Critical Job Variables**

1. Workload demands
2. Physical demands
3. Skill requirements
4. Organizational requirements
5. Performance requirements

**B. Soldier Characteristics**

1. Educational Requirements
    - a. Educational level
    - b. Reading level
  2. Mental category
  3. Physical abilities (PULHES)
  4. Abilities and skills
  5. Work attitudes
    - a. Work orientation
    - b. Dependability
  6. Special requirements
-

well as the old and new IEW systems. Abilities refer to the attributes of the individual performing the task. These attributes range from physical capabilities such as vision, hearing, and strength, to intellectual capabilities like reasoning and logical thought capacity. Abilities are relatively stable, enduring traits. Skills refer to the individual's level of proficiency on a specific task (Fleishman and Quaintance, 1984).

Based on almost a century of experimentation and theory construction, there are several taxonomies that could describe abilities and skills with well-defined and empirically based dimensions. The most useful, however, appears to be the Manual for Abilities Requirements Scales (MARS) developed by Fleishman and his associates (Fleishman and Quaintance, 1984, Appendix B). MARS has 52 defined dimensions, all measurable, which are shown in Table 2.

This taxonomy is suggested for a number of reasons. First, it has been widely tested and used in a wide variety of civilian and military jobs and tasks. Second, it has been the most extensively used taxonomy for a considerable number of military jobs. Third, analytic methods are available to extract information about each of these abilities from narrative descriptions of the tasks for new systems; empirical measurement is not essential. Fourth, the methods associated with this technique have been shown to give high reliability for the abilities and skills that may be needed for new IEW system tasks. The information so derived can be compared with the ability and skill capabilities of the existing and appropriate MOS soldiers who might be called upon to perform the new IEW system jobs and tasks.

When applied, the method brings forth two kinds of information -- whether or not the ability (as listed in Table 2) is required for the performance and how much of the ability is required. The first step identifies the required abilities and the second step identifies the skill levels required for those abilities needed for the operational task.

Many experimental studies have demonstrated the need for some subset of the abilities listed in Table 2 to perform human operational tasks. They may be seen as abilities the human must possess to some degree or else he or she cannot perform satisfactorily. On the other hand, many human jobs can be done quite well without many of the abilities. For example, the need for NIGHT VISION (#23) is obviously restricted to those situations where ambient and task lighting is low. What one attempts to do for each job or task is to derive a profile of those abilities required for the job, eliminating those that either are not required or have very low importance. The result

**Table 2**

**MARS Abilities and Skills Dimensions\***

---

1. ORAL COMPREHENSION	27. GLARE SENSITIVITY
2. WRITTEN COMPREHENSION	28. GENERAL HEARING
3. ORAL EXPRESSION	29. AUDITORY ATTENTION
4. WRITTEN EXPRESSION	30. SOUND LOCALIZATION
5. MEMORIZATION	31. SPEECH HEARING
6. PROBLEM SENSITIVITY	32. SPEECH CLARITY
7. ORIGINALITY	33. VISUALIZATION
8. INDUCTIVE REASONING	34. STATIC STRENGTH
9. CATEGORY FLEXIBILITY	35. EXPLOSIVE STRENGTH
10. DEDUCTIVE REASONING	36. DYNAMIC STRENGTH
11. INFORMATION ORDERING	37. TRUNK STRENGTH
12. MATHEMATICAL REASONING	38. STAMINA
13. NUMBER FACILITY	39. EXTENT FLEXIBILITY
14. FLUENCY OF IDEAS	40. DYNAMIC FLEXIBILITY
15. TIME SHARING	41. GROSS BODY EQUILIBRIUM
16. FLEXIBILITY OF CLOSURE	42. SPEED OF LIMB MOVEMENT
17. SPEED OF CLOSURE	43. GROSS BODY COORDINATION
18. SELECTIVE ATTENTION	44. MULTI-LIMB COORDINATION
19. PERCEPTUAL SPEED AND ACCURACY	45. WRIST FINGER SPEED
20. SPATIAL ORIENTATION	46. FINGER DEXTERITY
21. NEAR VISION	47. MANUAL DEXTERITY
22. FAR VISION	48. ARM HAND STEADINESS
23. NIGHT VISION	49. CONTROL PRECISION
24. VISUAL COLOR DISCRIMINATION	50. RATE CONTROL
25. PERIPHERAL VISION	51. REACTION TIME
26. DEPTH PERCEPTION	52. CHOICE REACTION TIME

---

\*Source: Fleishman and Quaintance (1984), Appendix B.

is an "abilities profile" which is a major definition of the job in terms of the requirements for the people who are going to perform the job.

### A Flow Diagram Method

JAAS is a decision aid method that has been developed so that an abilities profile can be derived for any human job or task that can be described in a narrative summary. This decision aid was developed by Mallamad, Levine, and Fleishman (1980) for 40 of the abilities shown in Table 2.

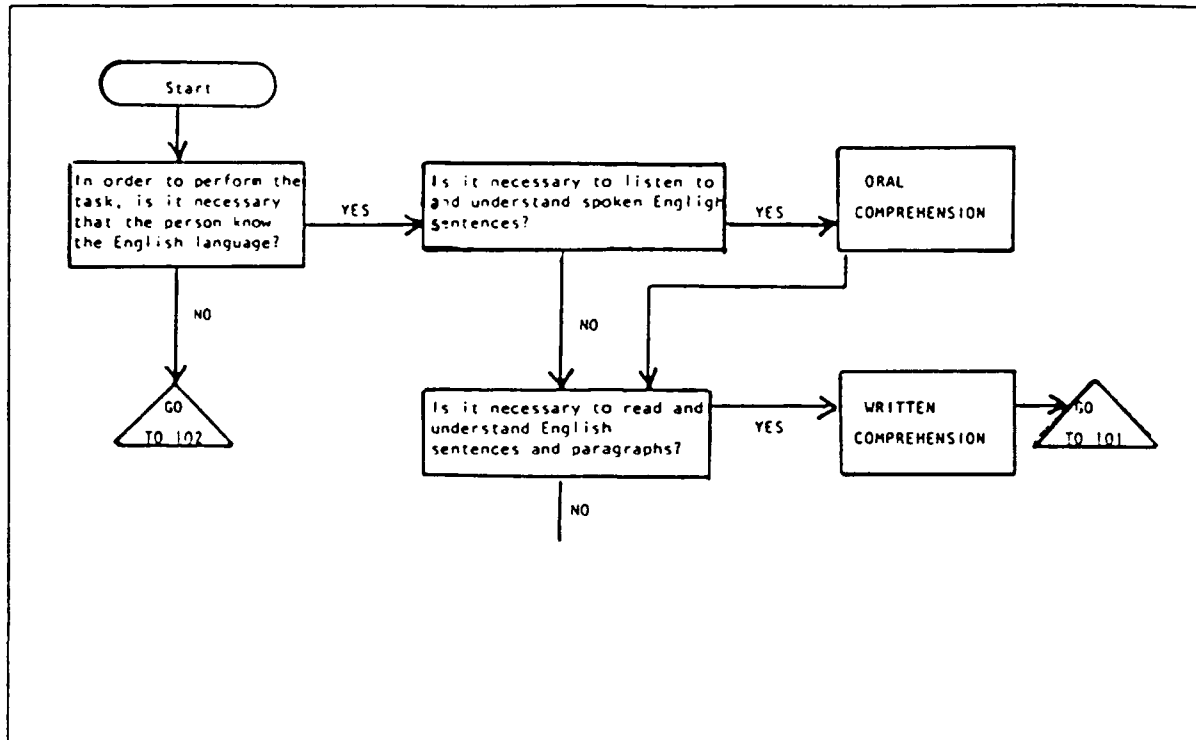
The basic form of this method is shown in Figure 1 which illustrates the flow diagrams and the questions asked to identify the presence or absence of the first two abilities in Table 2: ORAL COMPREHENSION and WRITTEN COMPREHENSION. The analyst is taken through a series of questions which by a simple "yes" or "no" can generate a profile of all abilities needed for the job or task.

In the present version here, the decision flow method has been expanded from the 40 dimensions in Mallamad, et. al., to the full 52 shown in Table 2; this expansion has meant adding dimensions 21 (NEAR VISION) through 32 (SPEECH CLARITY). Choice questions have been added for those 12 dimensions.

The decision flow diagrams comprise JAAS, Part 1. Appendix A provides the complete package containing decision flow diagrams for all 52 abilities and skills. It is a manual "paper and pencil" decision aid, although it is possible to develop a computer-based system.

A set of instructions has been developed incorporating a previously developed "Driving" example as a learning and warm-up task for individuals using the method. In actual fact, since this method has been in use for almost 13 years, several sample tasks are available including electronic troubleshooting and other, more complex, examples for learning how to use the system. Past experience with the method, however, has indicated that one simple example is usually quite sufficient for analysts and subject matter experts.

To be used for a given job or task, the method requires that a narrative job or task description be written. The analyst or subject matter expert then uses the description as the basis from which to answer the kinds of questions illustrated in Figure 1. In comparisons of old, current, or projected technological systems, narrative job or task descriptions would have to be written for each, and the analysis completed for each, for profile differences in abilities to become apparent.



**Figure 1.** An illustrative example of using the Job Abilities Assessment System (JAAS) to derive required job or task abilities.



## Clustering the Abilities

In using the results of this kind of analysis, many questions will be asked about the specific abilities shown in Table 2. But questions may also be asked at different conceptual levels and the abilities can be clustered (if they are present in the job or task) to answer those questions.

For example, there could well be questions about the strength and stamina requirements for the new set of IEW tasks. Five of the abilities in Table 2 relate to strength and stamina:

- 34. Static strength
- 35. Explosive strength
- 36. Dynamic strength
- 37. Trunk strength
- 38. Stamina.

These five could be examined as a cluster, and they would be relevant to questions about the physical demands of the new IEW jobs (cf., Table 1, 1.A.2).

Or, in a related area there could be concern about flexibility and physical coordination requirements. Five abilities cluster in that area:

- 39. Extent flexibility
- 40. Dynamic flexibility
- 41. Gross body equilibrium
- 43. Gross body coordination
- 45. Multi-limb coordination.

Many jobs continue to demand strength and stamina and flexibility and coordination (including current and projected IEW system jobs and tasks). These factors should not be ignored if they are present since they can markedly affect job performance levels.

Perhaps one of the most important and interesting of the possible clusters that could be developed from Table 1 concerns "cognitive abilities". Although there would surely be some disagreement among cognitive experts, the first 21 abilities in the list in Table 1 might be termed "cognitive abilities" with the possible addition of #32 (SPEECH CLARITY).

In previous work on the 96 CMF, previous analyses had suggested that the following cognitive abilities may be critical in military intelligence and IEW tasks:

- Verbal ability
- Reasoning ability
- Arithmetic reasoning

These abilities may be translated into the following equivalences from the list of cognitive abilities in Table 1:

- Verbal ability                   #3 ORAL EXPRESSION  
                                  #32 SPEECH CLARITY
- Reasoning ability               #8 INDUCTIVE REASONING  
                                  #10 DEDUCTIVE REASONING
- Memory                         #5 MEMORIZATION
- Arithmetic reasoning       #12 MATHEMATICAL REASONING  
                                  #13 NUMBER FACILITY

Questions that are asked of abilities at a higher conceptual level may be answered on the basis of estimates from lower level and more precise abilities.

Further work is underway to define various clusters of the 52 abilities listed in Table 1. One purpose is to demonstrate what kinds of questions can be asked at higher conceptual levels beyond the specificity demanded by MARS.

### Scaling the Abilities

Once the abilities needed in performing a specific job or task have been selected using JAAS, Part 1, comparisons can be made between jobs or tasks simply on the basis of which abilities are needed and which are not. However, not all jobs or tasks that require a given ability demand the same amount of that ability. Some tasks may need only a minimum amount of a given ability, while other tasks may require a very high degree of that same ability. Also, a task may need only a little of one ability, a great deal of another ability, and a medium amount of yet a third ability. Knowing not only if an ability is needed for a specific job or task but also how much of that ability is needed makes more detailed comparisons between jobs and tasks possible.

To facilitate judgements about how much of a given ability is needed, a second instrument has been developed. That instrument, Job Abilities Assessment System, Part 2, contained in Appendix B, presents each ability, together with its definition, on a page above a seven-point scale. For each ability judged necessary to the job or task being rated, a rater is asked to decide how much of the ability in question is needed in doing the task, with "1" indicating a minimum level of that ability, "7" indicating a very high level of that ability, and intermediate points in the scale indicating intermediate levels.

To assist the rater in making the judgement, three sample tasks are shown to the right of the scale, positioned according

to the average ratings given for that task or that ability by a large number of previous raters. As an example, see Figure 2. The ability in question is CONTROL PRECISION. The definition appears together with the number "49" and the name of the ability at the top of the page. Below that is the seven-point scale. To the right of the scale, three sample tasks are shown and their ratings indicated.

"Drill a tooth" is shown opposite the "6"; the average rating given this task in this skill by previous raters was 5.96, indicating that a great deal of CONTROL PRECISION is needed to drill a tooth. The second task shown, "Manipulate farm tractor controls", was judged to need an intermediate amount of CONTROL PRECISION, not as much as is needed in drilling teeth but more than needed for the third task, "Throw a light switch". At 1.24, throwing a light switch was judged to take a minimum amount of that skill. In other words, CONTROL PRECISION is one of the abilities needed in throwing a light switch, but the task demands very little CONTROL PRECISION.

The tasks shown as examples for the various abilities require abilities and skills other than the one they illustrate. For example, drilling a tooth takes abilities and skills in addition to CONTROL PRECISION. The types and amounts of other abilities are irrelevant to the placement of "Drill a tooth" on the CONTROL PRECISION scale. Drilling a tooth also has knowledge requirements, but they, too, are irrelevant here. The amount of CONTROL PRECISION involved in the task of drilling a tooth determines its placement in this case.

Once the abilities have been selected for a given job or task (JAAS, Part 1), each of the chosen abilities are rated in turn in JAAS, Part 2. Then from the results of the sequence of judgements, a profile of a job or task can be constructed, showing not just which abilities are involved in a specific job or task but also how much of each of the required abilities is needed.

### Using JAAS Results

**Profile comparisons.** Mention has already been made several times of comparisons between various profiles. One example is the set of abilities profiles associated with the current MOS-qualified individuals and the abilities requirements that they may be asked for in new systems. Another example is a comparison of profiles across MOS categories as a partial test of the appropriateness of a CMF.

These profiles are also useful for corrective action in new system design. If, for example, the abilities exceed both the capabilities of the currently available manpower and personnel pool and the probable characteristics of the people who will be

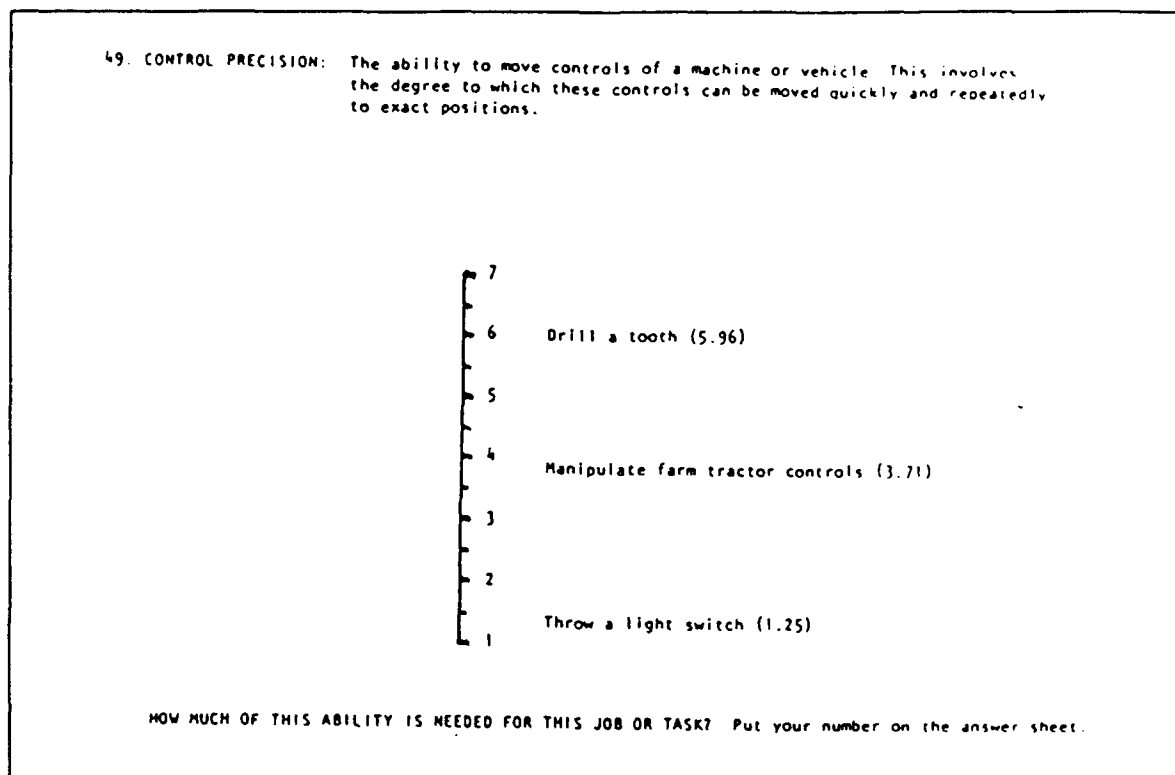


Figure 2. An example of the Job Abilities Assessment System (Part 2).

available to field the system, then corrections must be made in job and task design. This type of analysis has been used in the past with such systems as the Howitzer Improvement Program (HIP) and a number of the new air defense systems.

**Selection criteria.** By their particular nature, the abilities listed in Table 1 point directly to selection criteria and the appropriate selection tests that should be made to pick people who will operate and maintain future systems. At the moment, analysis suggests that ARITHMETIC REASONING is the principal ability that soldiers selected for military intelligence positions share. Profiles of the separate MI MOSs to be generated in this program may indicate that they share other abilities as well.

But the system profiles derived by JAAS can provide direct criteria for selection dimensions and the application of the results of Part 2 can also suggest the differential importance of each ability in all the abilities needed by the soldier. To be noted in passing is that every ability in the list of 52 has a number of selection tests that could be used to measure it in the selection context.

**Training requirements.** In developing training system requirements for new systems and all MOS categories, a number of kinds of training have to be specified. One of those is the fundamental abilities for which training should be provided. The JAAS-derived ability profile gives a direct indication of the areas in which training could well be considered as a foundation for eventual exact training in specific job tasks and skills. If, for example, ARITHMETIC REASONING is a foundation ability for the 96 CMF, it can very well be trained in a variety of appropriate contexts for eventual transfer of training to particular task performance (cf. Fleishman and Mumford, 1989).

## Test Applications

### Applying JAAS to MI MOSSs

Sample MOSSs. To test the application of JAAS to sample MOSSs from the 96 career management field, two MOSSs were selected:

- Interrogator (MOS 97E)
- Aerial Intelligence Specialist (MOS 96H)

Summary job descriptions for these MOSSs are given in Appendix C. Because of the major operational differences between these two MOSSs, using them should provide a useful test of whether or not distinctive and discriminable ability profiles can be obtained with military intelligence jobs from the implementation of the JAAS methodology. If different profiles are produced for these two MOSSs, it will establish the feasibility of applying JAAS to clarify the abilities and skills requirements of the MI MOSSs. If non-distinctive profiles are obtained, applying JAAS would seem fruitless.

Procedure. Thirteen (13) raters were given the job descriptions for 97E and 96H as shown in Appendix C and the JAAS Part 1 (Appendix A) and JAAS Part 2 (Appendix B) manuals. Their analysis task was to apply both parts of JAAS to the two MOS job descriptions. The raters were given brief descriptions of the JAAS technique and the analysis task. They were then allowed to take the test materials away and work on the analysis individually.

It was possible to have access to raters with a variety of military and technical backgrounds. Four of the raters were active duty Army personnel, three were Army Research Institute (ARI) personnel, and six were contractor personnel. Four of the contractor personnel had military service backgrounds ranging from 2 to 20 years in length. All of the contractor personnel had several years familiarity with military organizations and procedures. Thus, none of the raters was naive with respect to the Army. Two of the raters were subject matter experts (SMEs) with respect to military intelligence. Six of the other raters had considerable familiarity with MI either in terms of training requirements or research and development projects. The other five raters had no MI background. Seven of the raters had extensive training in psychology, four holding Ph.D.s in the field. The other six raters were not trained in psychology. Two of the raters had previous experience with the predecessor of the JAAS procedures. Eight of the raters were male and five, female.

**Results.** The primary test results are shown in the following series of Tables and Figures:

1. Table 3 shows the entire raw data set for the JAAS analysis for MOS 96H and for each of the 13 raters. The cell entries under the raters give the JAAS Part 2 scale value the rater generated; if the cell is empty, the rater judged that the ability was not needed for the job. In addition, four summary statistics are given: the number of raters who judged that "yes" the ability was needed, means of the scalar values, standard deviations and variance.

2. Table 4 looks at the abilities and skills for MOS 96H ordered in terms of the number of raters who judged the ability to be required (or not required) for the task. So, for example, all 13 raters judged FAR VISION as required, and only one so rated DYNAMIC STRENGTH. It can be seen that all 13 raters found 17 of the 52 abilities necessary for the MOS 96H job.

3. Table 5 presents the entire raw data set for the JAAS analysis of MOS 97E. Again, the values within the cells are the rater's judgements for that ability. Where a cell is empty, the rater judged the ability was not needed.

4. Table 6 shows the JAAS analysis of MOS 97E abilities and skills as ordered by raters' number of "yes" responses and the JAAS Part 2 means. It can be seen in Table 6 that all 13 raters found that 12 out of 52 abilities were needed for the performance of this job. It can also be seen that the bottom 12 abilities were judged not required for job performance.

5. Figure 3 presents a general graphical comparison of the two test MOSs in profile form and clustered in the eight categories described in a preceding chapter. It may be seen that (1) the individual MOSs generate distinct abilities profiles and (2) the profiles differ considerably one from the other. On the other hand, the two MOSs also share some strong common characteristics: communication, conceptual, and reasoning skills.

6. More detailed quantitative data are provided in Table 7. Abilities by clusters are shown; for each ability the number of raters requiring that ability for the job and the mean value of the job are given. An important part of these data is the opportunity to examine the relative homogeneity of the various clusters. For example, it can be seen in Table 7 that the abilities that constitute communication skills are all important both for MOS 96H and MOS 97E.

7. Data from Table 7 are presented graphically in Figure 4. For both MOS 96H and MOS 97E, the number of raters judging an ability to be required is shown for all 52 abilities, divided

Table 3

## JAA8 Analysis - MOS 96H Abilities and Skills

	ABILITIES	SUMMARY				RATERS												
		YES	MEAN	SD	VAR	1	2	3	4	5	6	7	8	9	10	11	12	13
1	ORAL COMPREHENSION	12	4.7	0.9	0.8	6.0	5.0	5.5	4.0	3.0	4.0	5.0	4.5	4.8	6.0		4.0	4.0
2	WRITTEN COMPREHENSION	13	5.3	1.2	1.4	6.0	6.0	6.0	4.0	6.0	3.0	5.0	5.0	3.0	6.9	6.0	6.0	6.0
3	ORAL EXPRESSION	13	5.2	1.1	1.2	5.7	5.5	6.2	4.0	3.0	4.5	6.0	5.0	6.4	6.5	6.5	4.0	4.5
4	WRITTEN EXPRESSION	10	4.5	1.2	1.5	6.0	5.0	6.5	3.5	3.0	4.0	3.0	4.0	4.2		6.0		
5	MEMORIZATION	13	4.6	1.3	1.7	4.5	5.0	3.5	3.0	4.5	2.0	7.0	4.3	4.0	5.0	6.5	5.5	5.5
6	PROBLEM SENSITIVITY	13	4.9	1.0	1.0	5.5	4.5	4.2	3.0	4.0	4.0	6.0	4.8	6.2	6.3	6.0	4.5	5.0
7	ORIGINALITY	8	4.4	1.1	1.2	5.5	5.0	4.5	2.5						5.7	5.0	4.0	3.0
8	INDUCTIVE REASONING	10	5.1	1.0	1.0	6.0	4.0		4.0		4.0		5.0	4.7	6.8	6.0	6.0	4.0
9	CATEGORY FLEXIBILITY	10	4.2	1.1	1.2	5.0	4.5	1.5	4.0		4.0		3.8	4.5		6.0	5.0	4.0
10	DEDUCTIVE REASONING	13	4.9	1.0	1.0	6.0	4.0	5.0	3.5	5.0	2.5	6.0	4.9	4.8	5.8	5.5	6.0	5.0
11	INFORMATION ORDERING	12	4.9	1.4	1.9	4.5	2.5		3.5	4.0	3.0	7.0	5.8	6.0	6.0	6.0	6.0	5.0
12	MATHEMATICAL REASONING	10	4.7	0.9	0.9	4.5	4.5	4.2	3.0			5.0		3.8	5.5	6.0	4.0	6.0
13	NUMBER FACILITY	13	3.7	1.2	1.4	4.5	3.5	3.0	2.5	3.0	2.0	3.0	3.0	3.0	5.2	5.5	3.5	6.0
14	FLUENCY OF IDEAS	10	4.4	1.3	1.8	4.0	3.5		3.0			2.0	5.0	5.7	5.9	6.0	5.5	3.5
15	TIME SHARING	13	5.5	0.8	0.6	4.0	5.0	6.0	5.0	5.5	5.0	7.0	5.8	4.8	6.7	5.8	5.0	5.5
16	FLEXIBILITY OF CLOSURE	13	5.5	0.9	0.8	6.0	5.0	6.1	5.0	3.5	4.0	6.0	6.3	6.1	5.6	6.0	6.0	6.5
17	SPEED OF CLOSURE	8	5.0	1.0	1.1	6.0	4.5		3.0			5.0	4.1		6.1		5.5	6.0
18	SELECTIVE ATTENTION	13	4.6	0.9	0.8	4.0	4.5	4.1	4.5	4.0	3.0	6.0	3.8	4.1	5.0	5.0	6.0	6.0
19	PERCEPTUAL SPD & ACCURACY	13	4.9	0.8	0.7	6.0	6.0	3.5	4.2	4.5	4.0	5.0	4.8	4.2	5.2	6.0	4.5	6.0
20	SPATIAL ORIENTATION	13	5.1	0.7	0.5	5.0	6.0	5.0	4.5	4.0	4.0	6.0	5.2	4.6	6.0	5.0	4.5	6.0
21	NEAR VISION	12	4.8	0.9	0.8	5.0	6.0	4.7	5.0	3.0	4.0	5.0	5.0	5.8	4.5		3.5	6.0
22	FAR VISION	13	5.7	1.5	2.1	6.5	5.5	1.5	6.5	6.5	6.0	6.0	6.2	6.6	6.7	6.5	3.5	6.5
23	NIGHT VISION	13	5.1	0.6	0.3	5.0	6.0	5.0	5.5	4.5	5.0	5.0	4.8	4.1	6.1	5.5	4.5	5.0
24	VISUAL COLOR DISCRIMINATION	13	4.4	1.4	2.1	6.0	6.0	5.4	4.0	2.0	2.0	3.0	4.9	6.2	3.7	4.5	3.5	6.0
25	PERIPHERAL VISION	11	4.2	0.5	0.3		4.5	4.5	4.0	3.0		4.0	4.4	4.4	4.3	4.4	3.5	5.0
26	DEPTH PERCEPTION	10	4.6	1.3	1.6		6.0		5.5	6.0		3.0	5.2	4.3	3.5	3.0	3.0	6.0
27	GLARE SENSITIVITY	12	4.3	1.3	1.8	5.0	5.5	5.9	5.0	3.0	2.0	2.0	4.9	4.2		4.6	3.5	6.0
28	GENERAL HEARING	9	4.5	0.4	0.2	4.0	4.5	4.1	5.0	4.5		5.0	4.2				4.0	5.0
29	AUDITORY ATTENTION	8	5.5	0.6	0.3		5.5	4.7	6.0	4.5		6.0	5.7				5.5	6.0
30	SOUND LOCALIZATION	5	4.2	1.0	0.9		5.0		5.5	3.7			2.8				4.0	
31	SPEECH HEARING	12	5.0	0.9	0.9	6.0	5.5	5.5	5.0	4.0	3.0	6.0	4.0	5.2	5.5		4.0	6.0
32	SPEECH CLARITY	13	5.2	0.8	0.6	6.0	6.0	5.5	4.0	4.0	5.0	5.0	5.1	5.0	6.5	5.5	4.0	6.0
33	VISUALIZATION	11	5.2	0.8	0.6	6.0	5.5	4.3	4.0		4.0	5.0	4.9	5.0	6.3		6.0	6.0



Table 3

## JAAS Analysis - MOS 96H Abilities and Skills (continued)

	ABILITIES	SUMMARY				RATERS												
		YES	MEAN	SD	VAR	1	2	3	4	5	6	7	8	9	10	11	12	13
34	STATIC STRENGTH	10	3.8	0.6	0.3	4.5	5.0	3.3	4.0	3.3			4.0	3.5	3.5		3.5	3.0
35	EXPLOSIVE STRENGTH	1	5.0	0.0	0.0		5.0											
36	DYNAMIC STRENGTH	1	4.0	0.0	0.0		4.0											
37	TRUNK STRENGTH	1	5.0	0.0	0.0		5.0											
38	STAMINA	2	3.0	1.0	1.0				4.0									2.0
39	EXTENT FLEXIBILITY	11	3.8	1.0	1.0		6.0	3.5	4.0	3.5	4.0	4.0	3.2	3.8	5.0	2.0		3.0
40	DYNAMIC FLEXIBILITY	3	4.7	0.9	0.8		6.0					4.0			4.1			
41	GROSS BODY EQUILIBRIUM	5	3.1	1.0	1.0		5.0	2.0		3.0	3.0							2.5
42	SPEED OF LIMB MOVEMENT	4	4.0	1.9	3.5		7.0			2.0		3.0	4.1					
43	GROSS BODY COORDINATION	5	3.5	1.4	2.1		6.0	2.3	4.0	2.0		3.0						
44	MULTI-LIMB COORDINATION	12	3.8	1.0	1.1	4.5	6.0	4.4	3.5	4.0	3.0	4.0	3.8	2.4	5.0	2.0		3.5
45	WRIST FINGER SPEED	9	3.0	1.4	2.1		6.0	1.5	4.0	2.0	2.0	2.0	2.0		4.5	3.0		
46	FINGER DEXTERITY	13	3.5	1.2	1.4	3.5	5.5	2.6	4.0	2.0	2.0	4.0	2.9	1.5	5.2	4.5	3.5	4.0
47	MANUAL DEXTERITY	12	4.0	1.0	1.1	3.5	6.0	3.4	4.0	2.5	3.0	5.0	4.2	2.6	5.4	4.5		4.0
48	ARM HAND STEADINESS	10	3.2	1.1	1.2		5.0	4.2	3.5		2.0	2.0	2.1	2.3	4.7		2.5	3.5
49	CONTROL PRECISION	13	3.9	0.7	0.5	3.0	5.0	3.7	4.0	4.5	3.0	3.0	4.0	4.8	4.9	3.5	3.0	4.0
50	RATE CONTROL	7	4.5	0.7	0.6		5.0	4.3		4.0		3.0	4.9	4.5		5.5		
51	REACTION TIME	4	3.6	1.4	1.9	2.5	6.0		3.0		3.0							
52	CHOICE REACTION	11	4.6	0.9	0.8	3.0	6.0	5.2	3.5	5.0		5.0	4.9	4.3		5.5	3.5	5.0

Table 4

JAAS Analysis - MOS 96H Abilities and Skills--Ordered by JAAS  
Part 1 "Yes" Responses and Part 2 Means

		YES	MEAN	SD	VAR
22	FAR VISION	13	5.7	1.5	2.1
15	TIME SHARING	13	5.5	0.8	0.6
16	FLEXIBILITY OF CLOSURE	13	5.5	0.9	0.8
2	WRITTEN COMPREHENSION	13	5.3	1.2	1.4
3	ORAL EXPRESSION	13	5.2	1.1	1.2
32	SPEECH CLARITY	13	5.2	0.8	0.6
23	NIGHT VISION	13	5.1	0.6	0.3
20	SPATIAL ORIENTATION	13	5.1	0.7	0.5
6	PROBLEM SENSITIVITY	13	4.9	1.0	1.0
10	DEDUCTIVE REASONING	13	4.9	1.0	1.0
19	PERCEPTUAL SPD & ACCURACY	13	4.9	0.8	0.7
5	MEMORIZATION	13	4.6	1.3	1.7
18	SELECTIVE ATTENTION	13	4.6	0.9	0.8
24	VISUAL COLOR DISCRIMINATION	13	4.4	1.4	2.1
49	CONTROL PRECISION	13	3.9	0.7	0.5
13	NUMBER FACILITY	13	3.7	1.2	1.4
46	FINGER DEXTERITY	13	3.5	1.2	1.4
31	SPEECH HEARING	12	5.0	0.9	0.9
11	INFORMATION ORDERING	12	4.9	1.4	1.9
21	NEAR VISION	12	4.8	0.9	0.8
1	ORAL COMPREHENSION	12	4.7	0.9	0.8
27	GLARE SENSITIVITY	12	4.3	1.3	1.8
47	MANUAL DEXTERITY	12	4.0	1.0	1.1
44	MULTI-LIMB COORDINATION	12	3.8	1.0	1.1
33	VISUALIZATION	11	5.2	0.8	0.6
52	CHOICE REACTION	11	4.6	0.9	0.8
25	PERIPHERAL VISION	11	4.2	0.5	0.3
39	EXTENT FLEXIBILITY	11	3.8	1.0	1.0
8	INDUCTIVE REASONING	10	5.1	1.0	1.0
12	MATHEMATICAL REASONING	10	4.7	0.9	0.9
26	DEPTH PERCEPTION	10	4.6	1.3	1.6
4	WRITTEN EXPRESSION	10	4.5	1.2	1.5
14	FLUENCY OF IDEAS	10	4.4	1.3	1.8
9	CATEGORY FLEXIBILITY	10	4.2	1.1	1.2
34	STATIC STRENGTH	10	3.8	0.6	0.3
48	ARM HAND STEADINESS	10	3.2	1.1	1.2
28	GENERAL HEARING	9	4.5	0.4	0.2
45	WRIST FINGER SPEED	9	3.0	1.4	2.1
29	AUDITORY ATTENTION	8	5.5	0.6	0.3
17	SPEED OF CLOSURE	8	5.0	1.0	1.1
7	ORIGINALITY	8	4.4	1.1	1.2
50	RATE CONTROL	7	4.5	0.7	0.6
30	SOUND LOCALIZATION	5	4.2	1.0	0.9
43	GROSS BODY COORDINATION	5	3.5	1.4	2.1
41	GROSS BODY EQUILIBRIUM	5	3.1	1.0	1.0
42	SPEED OF LIMB MOVEMENT	4	4.0	1.9	3.5
51	REACTION TIME	4	3.6	1.4	1.9
40	DYNAMIC FLEXIBILITY	3	4.7	0.9	0.8
38	STAMINA	2	3.0	1.0	1.0
35	EXPLOSIVE STRENGTH	1	5.0	0.0	0.0
37	TRUNK STRENGTH	1	5.0	0.0	0.0
36	DYNAMIC STRENGTH	1	4.0	0.0	0.0

Table 5

## JAAS Analysis - MOS 97E Abilities and Skills

	ABILITIES	SUMMARY				RATERS												
		YES	MEAN	SD	VAR	1	2	3	4	5	6	7	8	9	10	11	12	13
1	ORAL COMPREHENSION	13	5.8	0.4	0.2	6.0	5.0	5.5	6.0	6.0	5.0	6.0	6.0	6.0	6.0	6.5	6.0	6.0
2	WRITTEN COMPREHENSION	13	6.0	0.4	0.2	6.0	6.0	5.0	5.5	6.0	6.0	6.0	6.0	6.5	6.5	6.5	5.5	6.0
3	ORAL EXPRESSION	13	5.5	0.8	0.6	5.7	4.5	4.3	6.0	6.0	4.0	5.0	6.0	6.3	6.4	6.0	5.0	6.0
4	WRITTEN EXPRESSION	13	5.4	0.8	0.6	6.0	5.0	3.5	5.0	5.0	6.0	5.0	6.0	6.8	5.9	5.5	5.0	6.0
5	MEMORIZATION	12	4.8	1.1	1.1	4.5	4.0		4.0	5.0	3.0	5.0	4.0	5.0	6.6	6.5	6.0	4.0
6	PROBLEM SENSITIVITY	13	4.7	0.9	0.8	4.5	4.0	5.6	4.5	3.5	4.0	6.0	5.0	3.2	5.6	6.0	4.0	5.0
7	ORIGINALITY	13	4.4	0.9	0.9	4.5	3.5	4.3	4.5	6.0	4.0	5.0	3.0	3.5	5.8	5.0	5.0	3.0
8	INDUCTIVE REASONING	12	5.1	1.1	1.1	6.0	3.0	5.5	4.0	5.0	5.0		5.0	3.6	6.8	6.0	5.5	6.0
9	CATEGORY FLEXIBILITY	12	4.4	1.0	0.9	4.5	3.5	4.0	4.0	3.0	5.0		4.0	2.8	5.7	6.0	5.0	5.0
10	DEDUCTIVE REASONING	13	5.0	0.7	0.5	6.0	5.0	4.8	4.0	5.0	5.0	5.0	4.0	4.9	5.0	6.0	5.5	6.0
11	INFORMATION ORDERING	12	4.7	0.9	0.9	4.5		3.3	4.0	3.6	5.0	5.0	6.0	3.5	4.4	6.0	6.0	5.0
12	MATHEMATICAL REASONING	8	3.5	1.2	1.4	2.0		4.3				3.0		2.8	5.2	4.0	5.0	2.0
13	NUMBER FACILITY	10	3.5	1.3	1.7	2.0		2.0		3.0		3.0	1.8	3.9	5.5	4.0	5.5	4.0
14	FLUENCY OF IDEAS	12	4.6	1.2	1.3		4.0	4.5	4.0	4.0	4.0	3.0	4.5	5.6	6.3	6.5	6.0	3.0
15	TIME SHARING	13	3.8	1.2	1.5	3.0	3.0	2.0	4.0	3.0	4.0	4.0	2.2	2.9	5.6	6.0	5.5	4.0
16	FLEXIBILITY OF CLOSURE	10	5.3	0.7	0.5		5.0	5.3	5.0		5.0	6.0		6.0	5.0	6.5	5.5	4.0
17	SPEED OF CLOSURE	7	4.7	1.2	1.6	3.5			3.5	6.0		6.0				6.0	5.0	3.0
18	SELECTIVE ATTENTION	12	4.5	1.3	1.7	4.0	4.5		4.0	4.0	4.0	6.0	1.4	5.8	6.5	4.0	5.5	4.0
19	PERCEPTUAL SPD & ACCURACY	13	4.3	1.4	2.0	5.0	4.5	2.3	3.5	2.4	5.0	5.0	2.0	3.6	6.2	6.5	5.5	5.0
20	SPATIAL ORIENTATION	12	4.3	1.0	0.9	4.5		4.3	4.5	2.0	5.0	5.0	4.0	4.7	4.2	4.0	6.0	3.0
21	NEAR VISION	10	4.2	1.6	2.7	5.0	3.0	5.9		3.0	2.0	6.0	4.8		6.3		1.5	4.0
22	FAR VISION	1	4.0	0.0	0.0		4.0											
23	NIGHT VISION	2	4.5	0.5	0.3		4.0			5.0								
24	VISUAL COLOR DISCRIMINATION	11	3.0	0.8	0.7	2.5	4.5	2.5	3.5	3.0	2.0	4.0	4.0		3.0		2.0	2.5
25	PERIPHERAL VISION	2	3.8	0.3	0.1							4.0						3.5
26	DEPTH PERCEPTION	1	2.0	0.0	0.0													2.0
27	GLARE SENSITIVITY	1	2.0	0.0	0.0					2.0								
28	GENERAL HEARING	9	3.8	1.0	0.9	4.0	3.5		3.5	5.0	4.0	4.0			5.5		2.0	3.0
29	AUDITORY ATTENTION	8	4.0	1.1	1.3	2.0	2.5		4.0	4.0		5.0		4.6	5.2			5.0
30	SOUND LOCALIZATION	2	3.8	1.3	1.6		2.5											5.0
31	SPEECH HEARING	13	5.5	0.9	0.8	6.0	4.5	5.3	4.0	6.0	4.0	7.0	5.2	6.0	6.6	6.0	6.0	5.0
32	SPEECH CLARITY	13	5.5	0.7	0.5	6.0	5.0	5.3	5.0	5.5	4.0	7.0	5.2	5.6	5.5	6.0	6.0	5.0
33	VISUALIZATION	13	4.9	1.5	2.4	4.0	5.0	6.0	5.5	2.0	6.0	6.0	1.8	4.0	6.5	6.5	6.0	4.0

Table 5

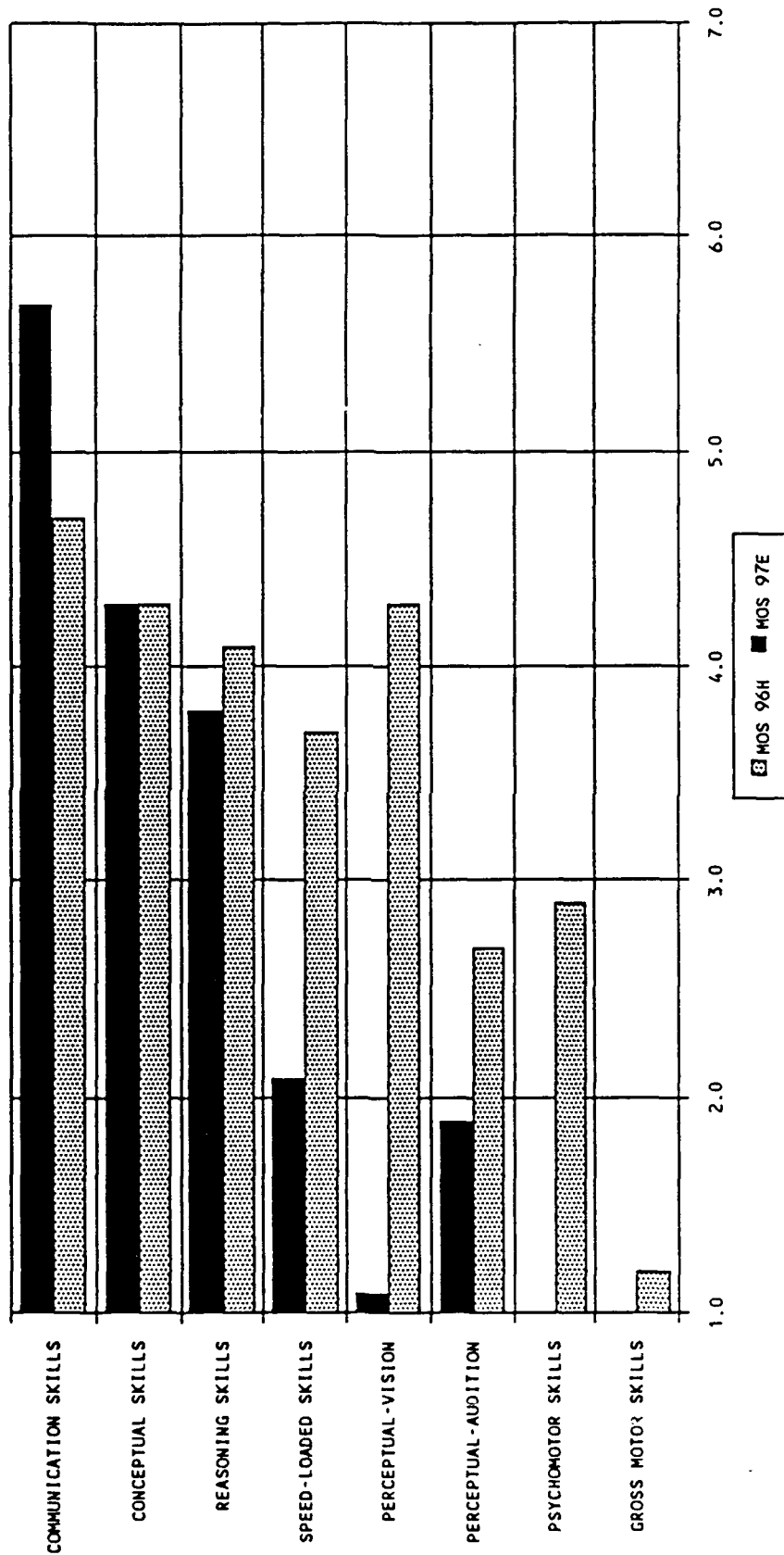
## JAAS Analysis - MOS 97E Abilities and Skills (continued)

ABILITIES	SUMMARY				RATERS												
	YES	MEAN	SD	VAR	1	2	3	4	5	6	7	8	9	10	11	12	13
34 STATIC STRENGTH	0																
35 EXPLOSIVE STRENGTH	0																
36 DYNAMIC STRENGTH	0																
37 TRUNK STRENGTH	0																
38 STAMINA	1	5.0	0.0	0.0				5.0									
39 EXTENT FLEXIBILITY	2	2.5	0.5	0.3		2.0											3.0
40 DYNAMIC FLEXIBILITY	0																
41 GROSS BODY EQUILIBRIUM	0																
42 SPEED OF LIMB MOVEMENT	0																
43 GROSS BODY COORDINATION	0																
44 MULTI-LIMB COORDINATION	3	2.7	0.2	0.1	2.5	2.5					3.0						
45 WRIST FINGER SPEED	7	3.9	1.0	1.0	5.0	4.0			2.0		3.0	5.0		4.5			4.0
46 FINGER DEXTERITY	7	3.8	0.9	0.8	5.0	4.5			2.0		4.0	4.0		4.0			3.0
47 MANUAL DEXTERITY	4	3.1	1.2	1.5		3.5			2.0		5.0						2.0
48 ARM HAND STEADINESS	4	2.7	1.1	1.1		3.0						1.0	3.9				3.0
49 CONTROL PRECISION	0																
50 RATE CONTROL	0																
51 REACTION TIME	0																
52 CHOICE REACTION	0																

Table 6

**JAAS Analysis - MOS 97E Abilities and Skills--Ordered by JAAS  
Part 1 "Yes" Responses and Part 2 Means**

		YES	MEAN	SD	VAR
2	WRITTEN COMPREHENSION	13	6.0	0.4	0.2
1	ORAL COMPREHENSION	13	5.8	0.4	0.2
3	ORAL EXPRESSION	13	5.5	0.8	0.6
31	SPEECH HEARING	13	5.5	0.9	0.8
32	SPEECH CLARITY	13	5.5	0.7	0.5
4	WRITTEN EXPRESSION	13	5.4	0.8	0.6
10	DEDUCTIVE REASONING	13	5.0	0.7	0.5
33	VISUALIZATION	13	4.9	1.5	2.4
6	PROBLEM SENSITIVITY	13	4.7	0.9	0.8
7	ORIGINALITY	13	4.4	0.9	0.9
19	PERCEPTUAL SPD & ACCURACY	13	4.3	1.4	2.0
15	TIME SHARING	13	3.8	1.2	1.5
8	INDUCTIVE REASONING	12	5.1	1.1	1.1
5	MEMORIZATION	12	4.8	1.1	1.1
11	INFORMATION ORDERING	12	4.7	0.9	0.9
14	FLUENCY OF IDEAS	12	4.6	1.2	1.3
18	SELECTIVE ATTENTION	12	4.5	1.3	1.7
9	CATEGORY FLEXIBILITY	12	4.4	1.0	0.9
20	SPATIAL ORIENTATION	12	4.3	1.0	0.9
24	VISUAL COLOR DISCRIMINATION	11	3.0	0.8	0.7
16	FLEXIBILITY OF CLOSURE	10	5.3	0.7	0.5
21	NEAR VISION	10	4.2	1.6	2.7
13	NUMBER FACILITY	10	3.5	1.3	1.7
28	GENERAL HEARING	9	3.8	1.0	0.9
29	AUDITORY ATTENTION	8	4.0	1.1	1.3
12	MATHEMATICAL REASONING	8	3.5	1.2	1.4
17	SPEED OF CLOSURE	7	4.7	1.2	1.6
45	WRIST FINGER SPEED	7	3.9	1.0	1.0
46	FINGER DEXTERITY	7	3.8	0.9	0.8
47	MANUAL DEXTERITY	4	3.1	1.2	1.5
48	ARM HAND STEADINESS	4	2.7	1.1	1.1
44	MULTI-LIMB COORDINATION	3	2.7	0.2	0.1
23	NIGHT VISION	2	4.5	0.5	0.3
25	PERIPHERAL VISION	2	3.8	0.3	0.1
30	SOUND LOCALIZATION	2	3.8	1.3	1.6
39	EXTENT FLEXIBILITY	2	2.5	0.5	0.3
38	STAMINA	1	5.0	0.0	0.0
22	FAR VISION	1	4.0	0.0	0.0
26	DEPTH PERCEPTION	1	2.0	0.0	0.0
27	GLARE SENSITIVITY	1	2.0	0.0	0.0
34	STATIC STRENGTH	0			
35	EXPLOSIVE STRENGTH	0			
36	DYNAMIC STRENGTH	0			
37	TRUNK STRENGTH	0			
40	DYNAMIC FLEXIBILITY	0			
41	GROSS BODY EQUILIBRIUM	0			
42	SPEED OF LIMB MOVEMENT	0			
43	GROSS BODY COORDINATION	0			
49	CONTROL PRECISION	0			
50	RATE CONTROL	0			
51	REACTION TIME	0			
52	CHOICE REACTION	0			



**Figure 3. Abilities and skills profile comparisons**

Table 7

## Comparisons of Skills and Abilities - MOS 96H and MOS 97E

	ABILITY	# R	MEAN	# R	MEAN
	COMMUNICATION SKILLS	96H	96H	97E	97E
1	ORAL COMPREHENSION	12	4.7	13	5.8
2	WRITTEN COMPREHENSION	13	5.3	13	6.0
3	ORAL EXPRESSION	13	5.2	13	5.5
4	WRITTEN EXPRESSION	10	4.5	13	5.4
31	SPEECH HEARING	12	5.0	13	5.5
32	SPEECH CLARITY	13	5.2	13	5.5
	CONCEPTUAL SKILLS	96H	96H	97E	97E
5	MEMORIZATION	13	4.6	12	4.8
6	PROBLEM SENSITIVITY	13	4.9	13	4.7
7	ORIGINALITY	8	4.4	13	4.4
9	CATEGORY FLEXIBILITY	10	4.2	12	4.4
14	FLUENCY OF IDEAS	10	4.4	12	4.6
16	FLEXIBILITY OF CLOSURE	13	5.5	10	5.3
18	SELECTIVE ATTENTION	13	4.6	12	4.5
20	SPATIAL ORIENTATION	13	5.1	12	4.3
33	VISUALIZATION	11	5.2	13	4.9
	REASONING SKILLS	96H	96H	97E	97E
8	INDUCTIVE REASONING	10	5.1	12	5.1
10	DEDUCTIVE REASONING	13	4.9	13	5.0
11	INFORMATION ORDERING	12	4.9	12	4.7
12	MATHEMATICAL REASONING	10	4.7	8	3.5
13	NUMBER FACILITY	13	3.7	10	3.5
	SPEED LOADED SKILLS	96H	96H	97E	97E
15	TIME SHARING	13	5.5	13	3.8
17	SPEED OF CLOSURE	8	5.0	7	4.7
19	PERCEPTUAL SPD & ACCURACY	13	4.9	13	4.3
51	REACTION TIME	4	3.6	0	
52	CHOICE REACTION	11	4.6	0	
	PERCEPTUAL SKILLS-VISION	96H	96H	97E	97E
21	NEAR VISION	12	4.8	10	4.2
22	FAR VISION	13	5.7	1	4.0
23	NIGHT VISION	13	5.1	2	4.0
24	VISUAL COLOR DISCRIMINATION	13	4.4	11	3.0
25	PERIPHERAL VISION	11	4.2	2	3.8
26	DEPTH PERCEPTION	10	4.6	1	2.0
27	GLARE SENSITIVITY	12	4.3	1	2.0

Table 7

Comparisons of Skills and Abilities - MOS 96H and MOS 97E  
(continued)

	ABILITY	# R	MEAN	# R	MEAN
	PERCEPTUAL SKILLS-AUDITION	96H	96H	97E	97E
28	GENERAL HEARING	9	4.5	9	3.8
29	AUDITORY ATTENTION	8	5.5	8	4.0
30	SOUND LOCALIZATION	5	4.2	2	3.8
	PSYCHOMOTOR SKILLS	96H	96H	97E	97E
42	SPEED OF LIMB MOVEMENT	4	4.0	0	
44	MULTI-LIMB COORDINATION	12	3.8	3	2.7
45	WRIST FINGER SPEED	9	3.0	7	3.9
46	FINGER DEXTERITY	13	3.5	7	3.8
47	MANUAL DEXTERITY	12	4.0	4	3.1
48	ARM HAND STEADINESS	10	3.2	4	2.7
49	CONTROL PRECISION	13	3.9	0	
50	RATE CONTROL	7	4.5	0	
	GROSS MOTOR SKILLS	96H	96H	97E	97E
34	STATIC STRENGTH	10	3.8	0	
35	EXPLOSIVE STRENGTH	1	5.0	0	
36	DYNAMIC STRENGTH	1	4.0	0	
37	TRUNK STRENGTH	1	5.0	0	
38	STAMINA	2	3.0	1	5.0
39	EXTENT FLEXIBILITY	11	3.8	2	2.5
40	DYNAMIC FLEXIBILITY	3	4.7	0	
41	GROSS BODY EQUILIBRIUM	5	3.1	0	
43	GROSS BODY COORDINATION	5	3.5	0	



96H 97E

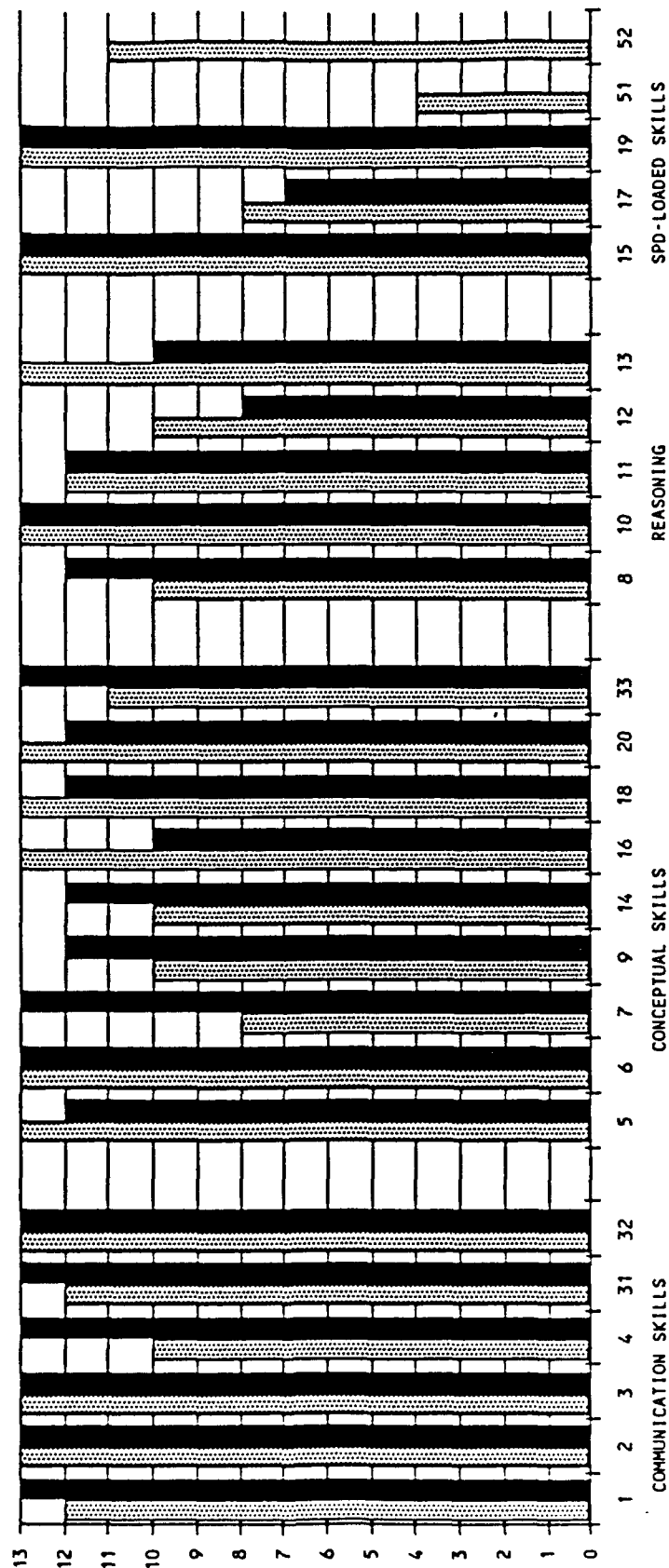


Figure 4. Skills and abilities: Number of "yes" responses

96H 97E

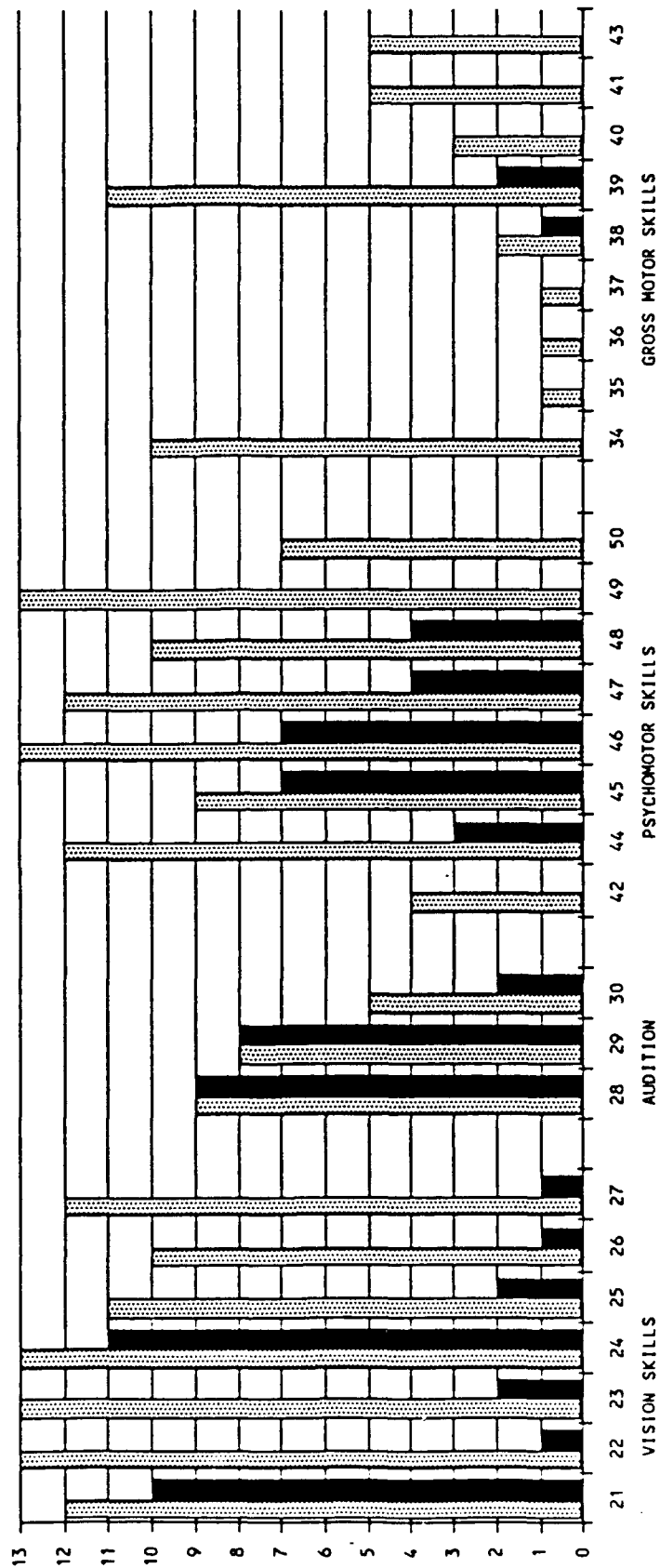


Figure 4. Skills and abilities: Number of "yes" responses (continued)

into the eight clusters. As noted, almost all the raters felt that the six abilities in the Communication Skill cluster were important for the jobs of both MOSs. A very different profile comparison occurs, however, for Gross Motor Skills, almost all of which are of little importance for MOS 97E. Even for MOS 96H, only two abilities (#34, STATIC STRENGTH; #39, EXTENT FLEXIBILITY) were chosen by a majority of raters.

**Summary.** The test data presented in this section show very clearly that the JAAS can be used to generate abilities and skills profiles for two military intelligence MOSs. Very high inter-rater agreement was achieved with the method. Further, the abilities and skills profiles appear to be conceptually and logically consistent with the nature of the jobs and the tasks that must be performed in these two MI MOSs. Not only does JAAS identify what abilities are required, but JAAS also provides an estimate of how much of the ability (i.e., skill level) is required in job performance.

#### Applying JAAS to UAV

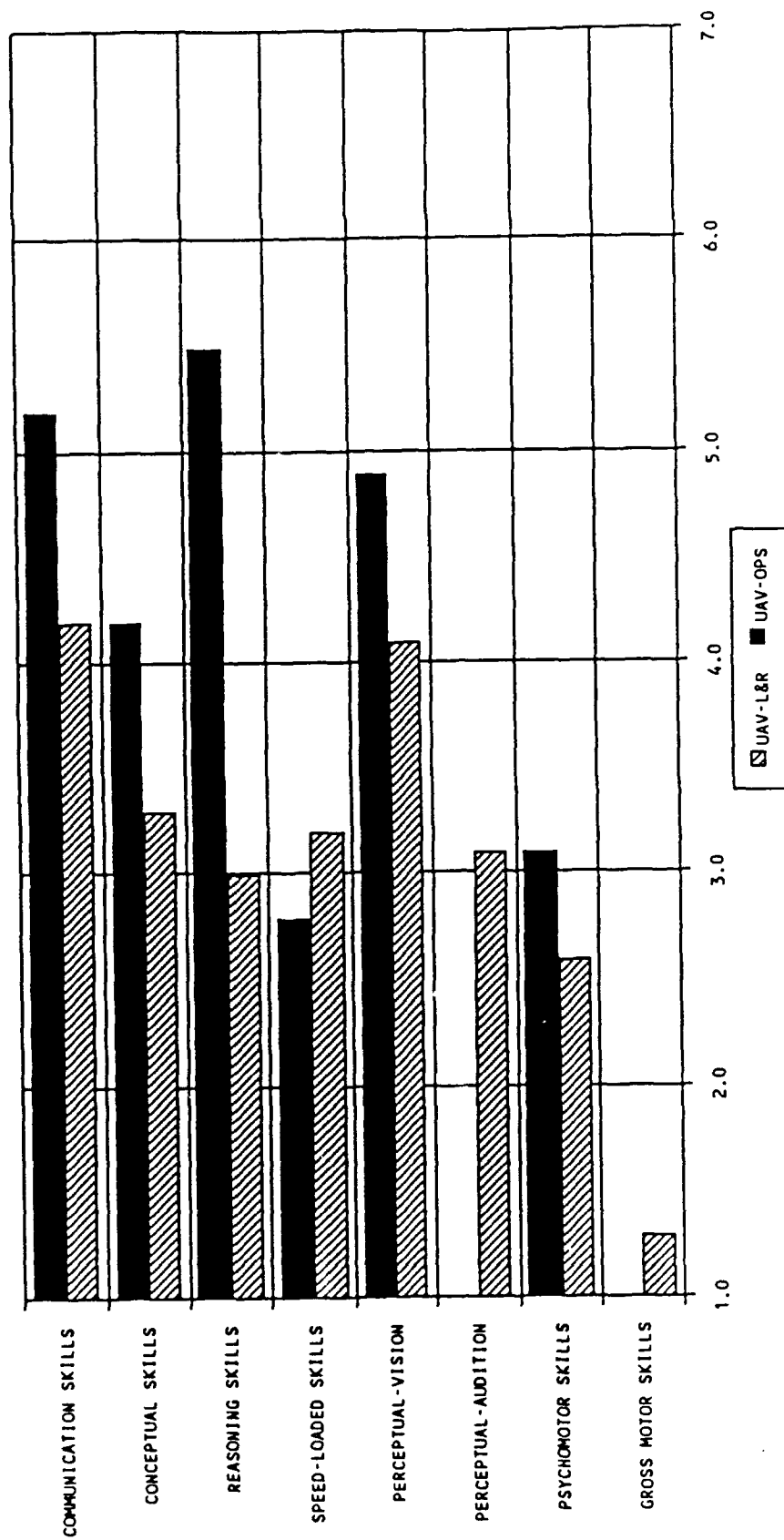
Another advantage of the JAAS technique is that it can be used to identify abilities and skill requirements of systems. As noted above in the introduction, this program is concerned with a number of new IEW systems including the Unmanned Aerial Vehicle (UAV). It was decided to demonstrate the use of JAAS by evaluating two phases of UAV mission functions:

- UAV operations
- UAV launch and recovery

A single analyst, very familiar with the current status of the UAV operations and launch and recovery system, was used to apply JAAS to those two UAV mission functions.

Figure 5 shows the results of using JAAS with the UAV. The operations phase is judged to make very high demands on Communication Skills, Reasoning Skills, and Perceptual (Vision) Skills. Indeed, for operations there are rather high demands in all cluster areas except Gross Motor Skills. The launch and recovery phase, on the other hand, seems to have a more balanced set of requirements across seven clusters--again with only a slight demand in the Gross Motor Skills areas. The highest demands for launch and recovery come in the Communication Skills and Perceptual (Vision) Skills areas.

A closer comparison can be made in Figure 6 where both operations and launch and recovery are shown by cluster and individual abilities within the clusters. On the whole, as expected from Figure 5, the general level of requirements is higher for operations than for launch and recovery.



**Figure 5. Comparison - UAV OPS vs. UAV L&R by Clusters**

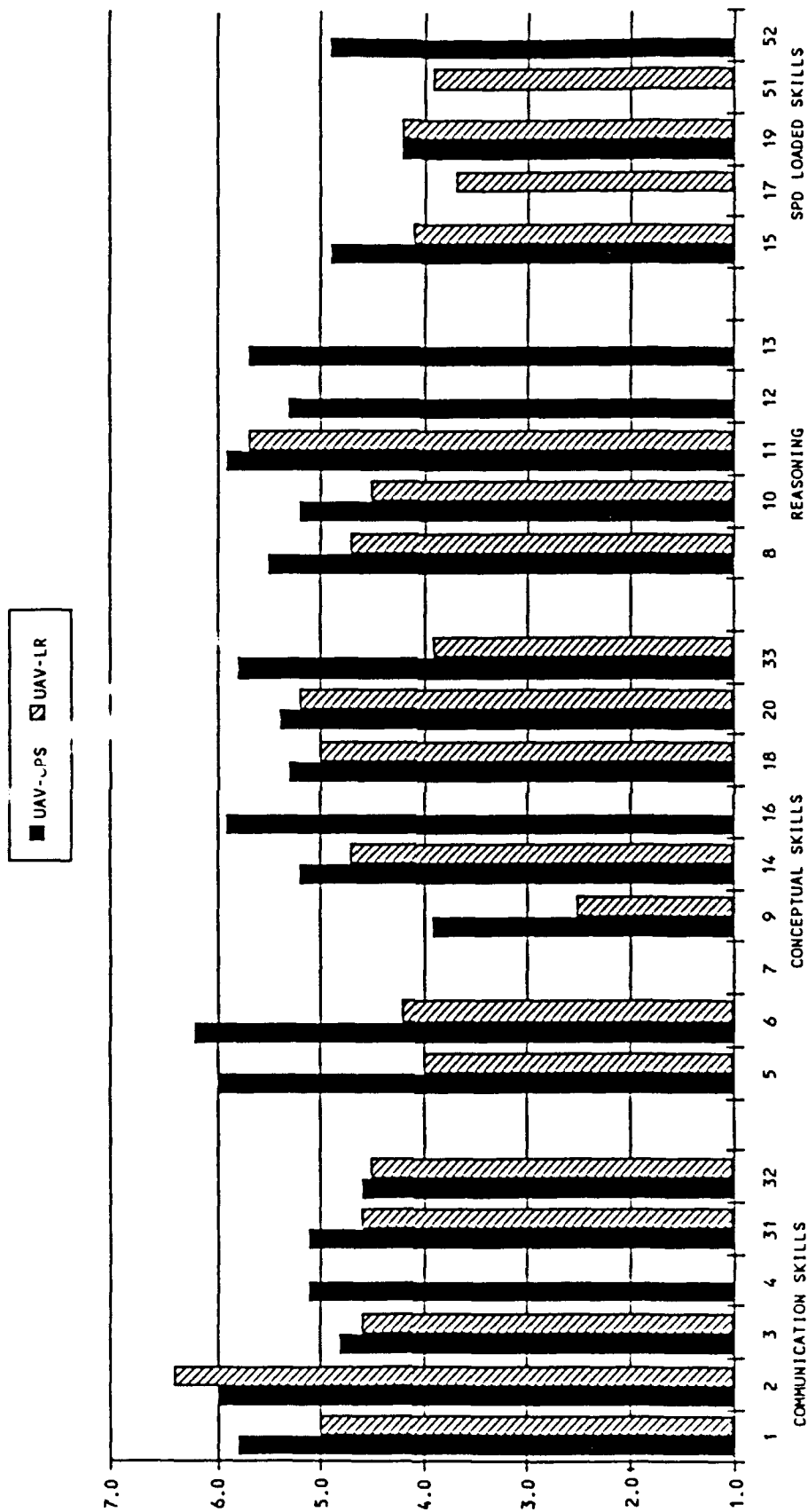


Figure 6. Comparison - UAV OPS vs. UAV L&R by Clusters and Abilities

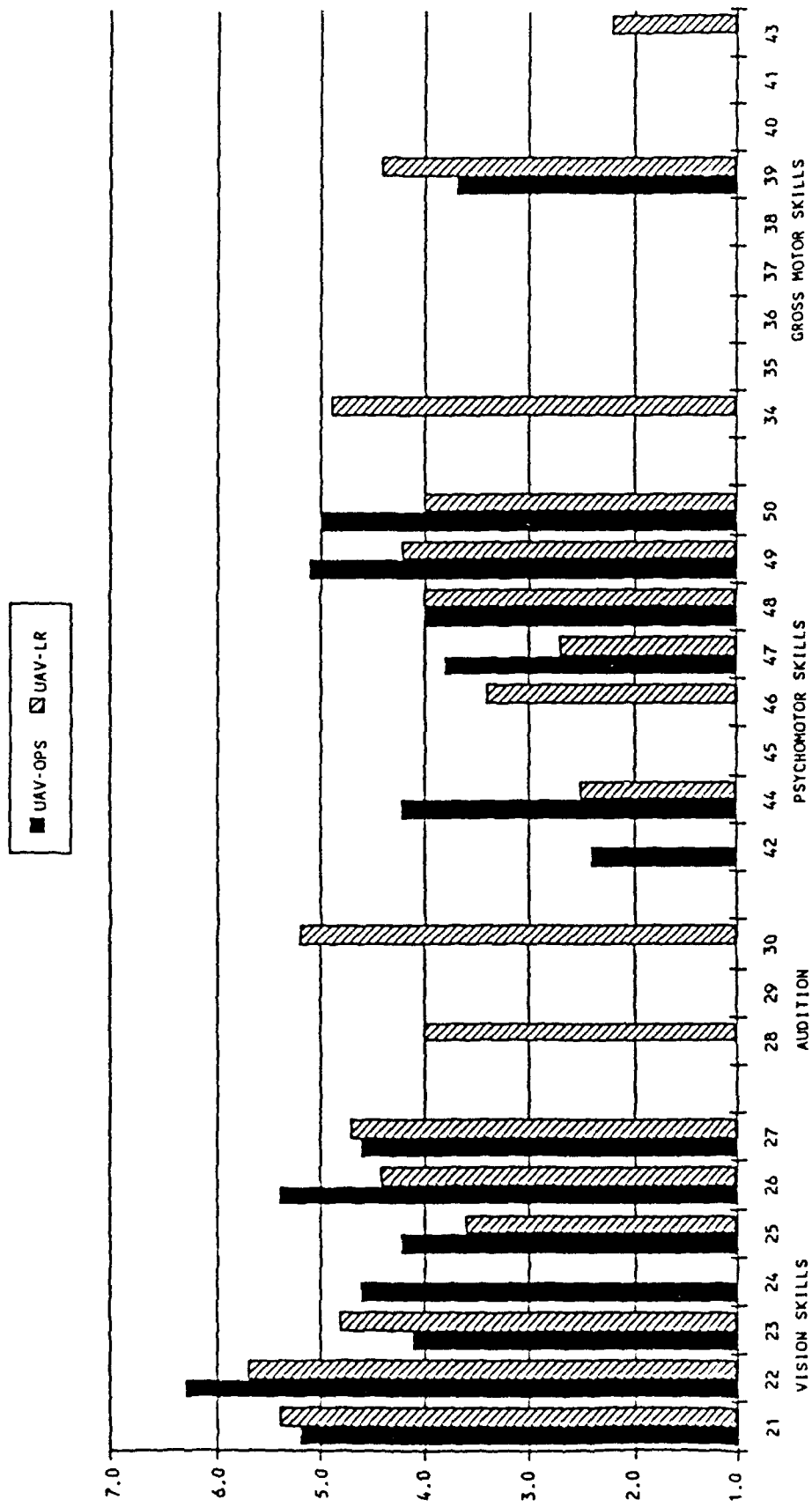


Figure 6. Comparison - UAV OPS vs. UAV L&R by Clusters and Abilities (continued)

Of particular interest are those abilities that equal or are greater than 6.0. They are:

- UAV-Operations: WRITTEN COMPREHENSION (#2)
- UAV-Launch and Recovery: WRITTEN COMPREHENSION (#2)
- UAV-Operations: MEMORIZATION (#5)
- UAV-Operations: PROBLEM SENSITIVITY (#6)
- UAV-Operations: FAR VISION (#22)

It is interesting that probably none of these critical abilities relate directly to equipment variables. But there might be some clues to equipment and procedural deficiencies in the case of UAV operations where a very high level of MEMORIZATION is required.

This example illustrates that the JAAS technique can also be applied to system jobs and tasks. Further, while a much larger sample of raters would have to be used to get good scalar estimates, the first-cut shown in Figures 5 and 6 suggests some very high skill level requirements in some areas for the UAV.

#### Comparing UAV and MOS 96H

With the data now presented and available, it is possible to illustrate another kind of profile comparison. Given the UAV operations estimate, one can compare that estimate directly with the abilities and skills profiles derived for MOS 96H. It is assumed that MOS 97E would not be appropriate for this type of system and equipment assignment.

Figure 7 shows precisely this type of comparison using the MOS 96H data and the UAV Operations data. Each cluster may be summarized as follows:

1. MOS 96H personnel possess the communication skills required for UAV Operations, but some additional training may be required.
2. MOS 96H personnel possess the conceptual skills required for UAV Operations.
3. MOS 96H personnel may require training enhancement in the Reasoning Skills required for UAV Operations; a closer look at the individual abilities within the cluster is required.
4. MOS 96H personnel possess the speed-loaded skills required for UAV Operations.
5. MOS 96H personnel may not possess sufficient Perceptual (Vision) Skills; a closer look at the individual abilities within the cluster is required.

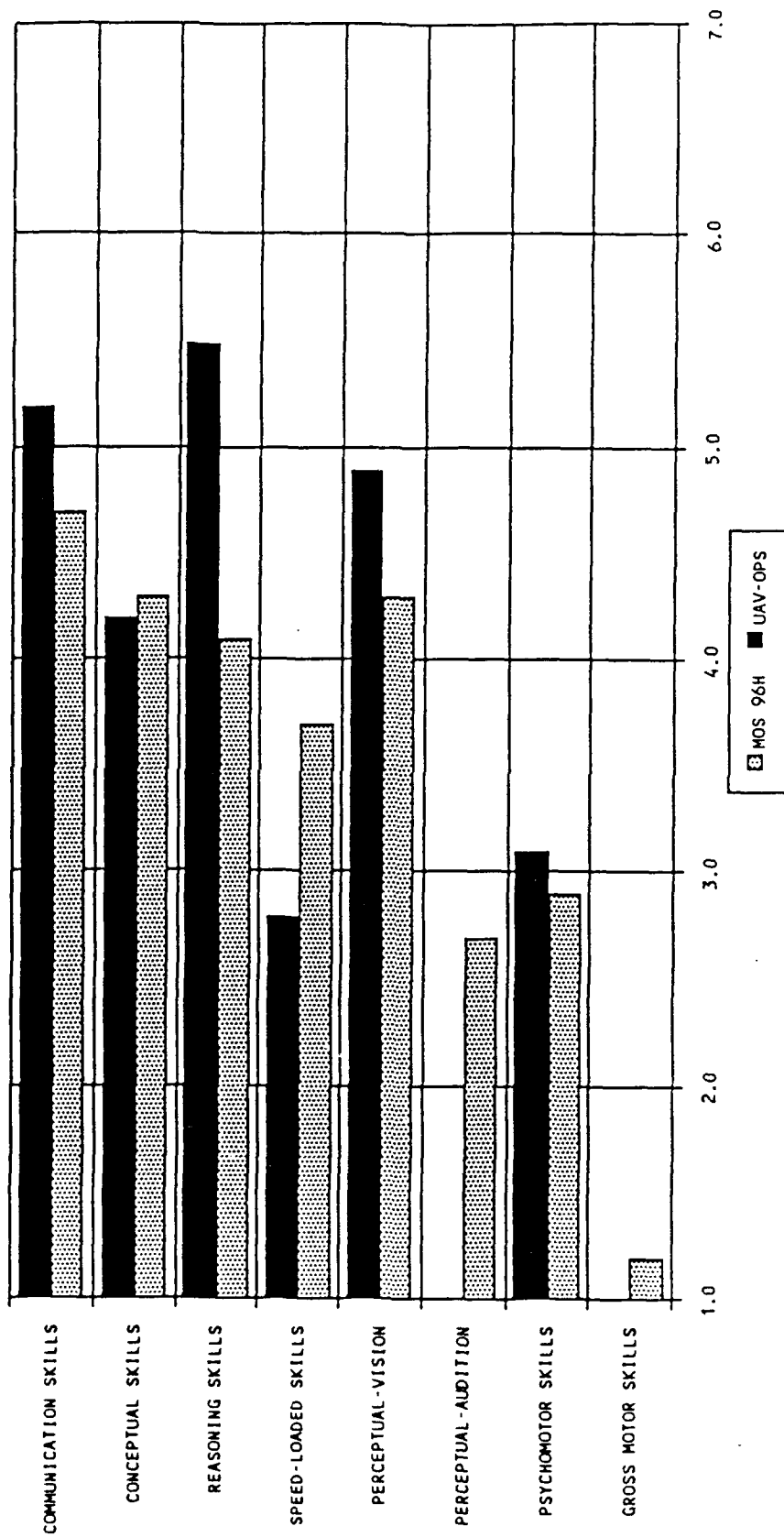


Figure 7. Comparison - MOS 96H vs. UAV OPS by Clusters



6. MOS 96H personnel possess Perceptual (Audition) Skills that are not needed for the UAV Operations.

7. MOS 96H personnel possess the Psychomotor Skills required for UAV Operations, but there may be some problem with RATE CONTROL.

8. MOS 96H personnel possess Gross Motor Skills that are not required for UAV Operations.

In four cases (communications, reasoning, perceptual-vision, and psychomotor skills), the system requirements exceed the presumed MOS capabilities. The next step is to take a closer look into the individual ability patterns; data for that inspection are shown in Figure 8. The major problem with respect to Reasoning Skills would appear to be #13, NUMBER FACILITY. This in turn suggests an equipment requirement to manipulate numbers without aiding. There is no outstanding specific deficiency in Perceptual (Visual) Skills, but the very high level of skill requirement for all seven abilities in that category is notable. In all four cases, the system itself should be examined from a human engineering standpoint to see if the requirements can be lowered by task re-design.

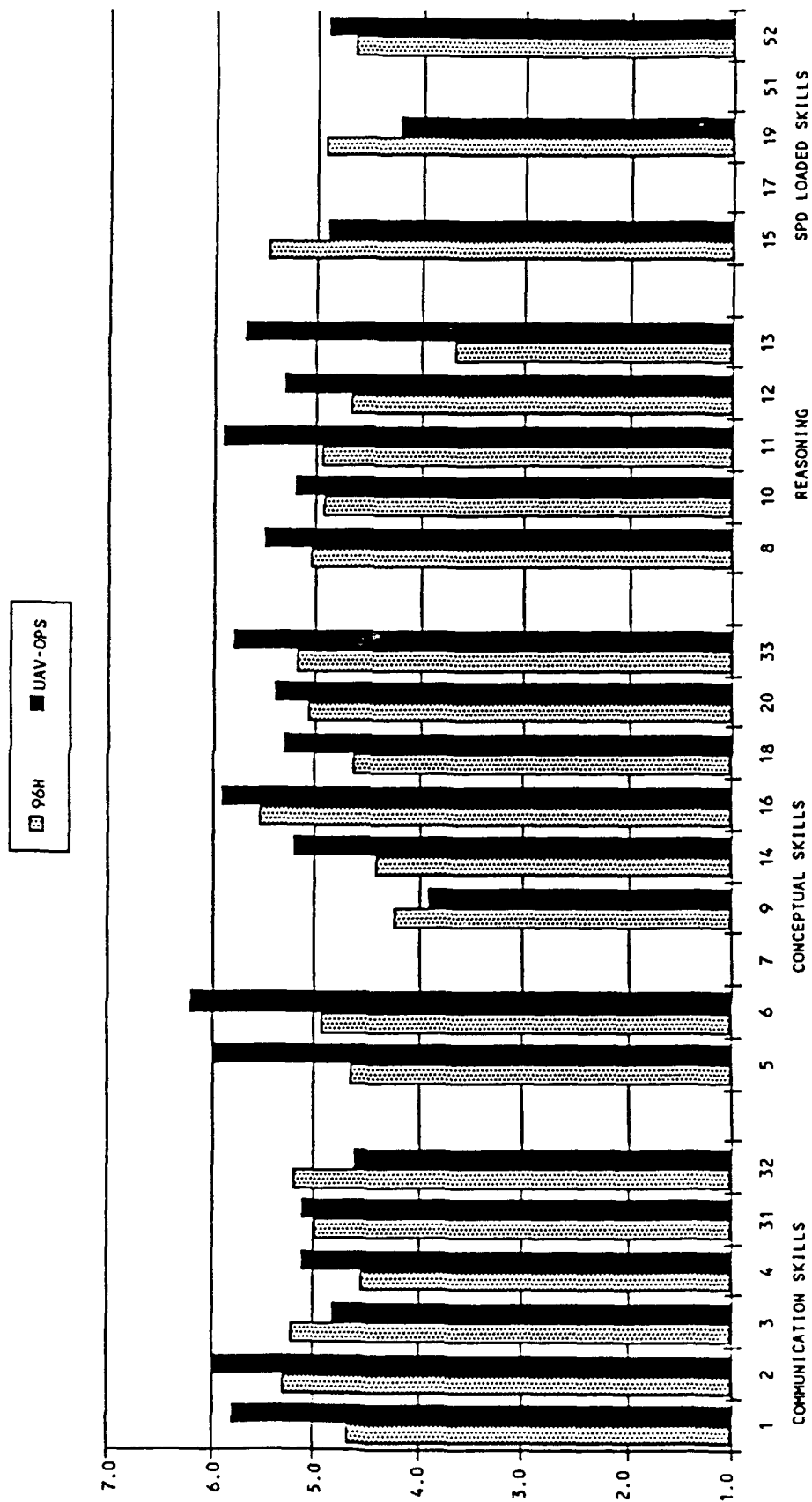
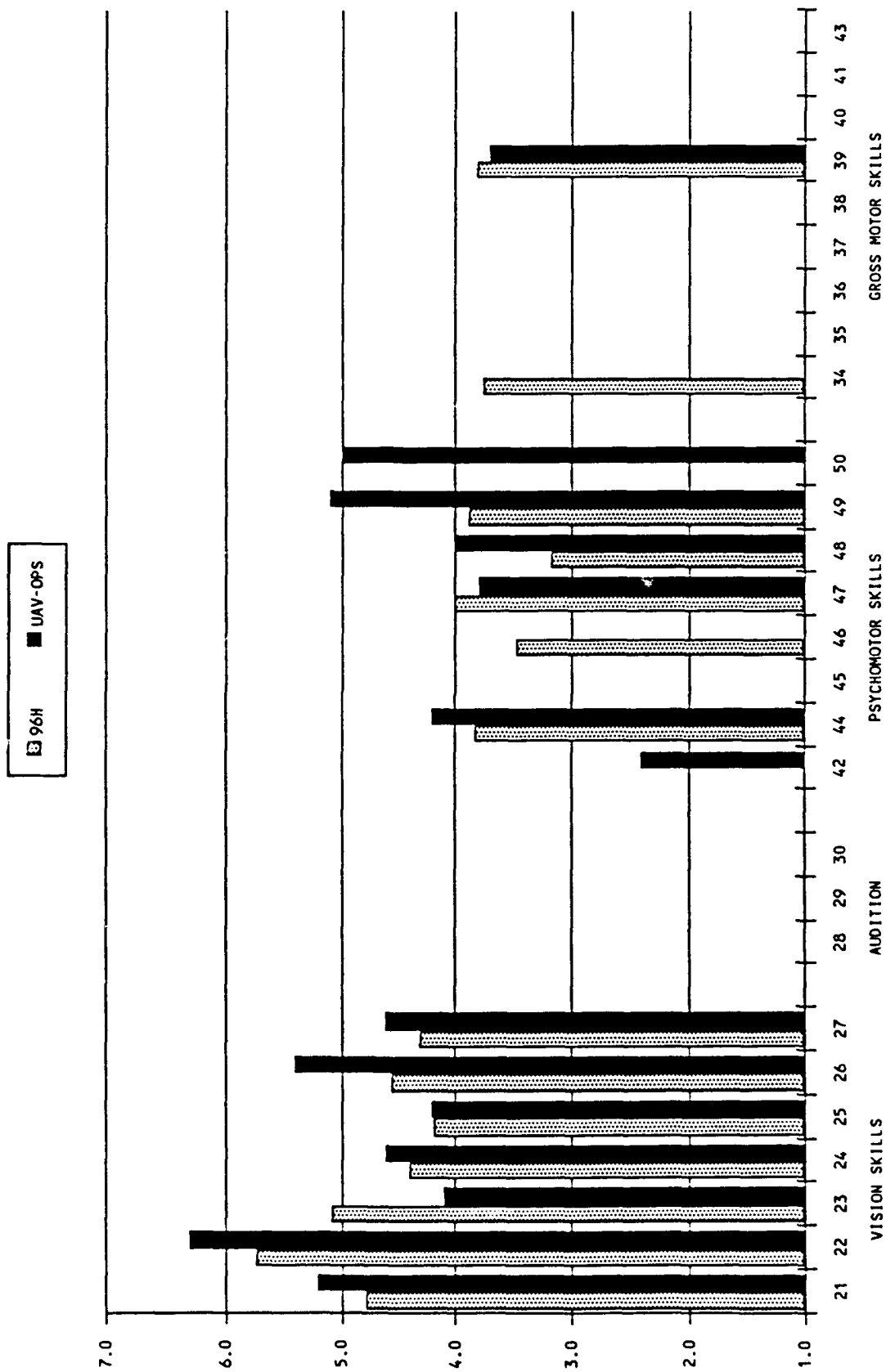


Figure 8. Comparison - MOS 96H vs. UAV OPS by Clusters and Abilities



**Figure 8. Comparison - MOS 96H vs. UAV OPS by Clusters and Abilities (continued)**

## Conclusions

The work reported in this research note represents methodological activities in the selection of an initial technique for identifying MOS capabilities and IEW system requirements in terms of abilities and skills. The technique is called the "Job Abilities Assessment System" (JAAS). To further the evolution of JAAS for routine operational use, four activities have been underway.

First, JAAS has been subjected to limited applications to determine the adequacy of the rating method and rater reliability with respect to MI jobs and tasks.

Second, JAAS, modified as a result of the test applications, must be applied in a broader context. SMEs representing all 96 CMF MOSs should use the instrument to assess MOS capabilities. This further test of the instrument will start to build a 96 CMF MOS ability and skill inventory.

Third, more analysis data are needed on the UAV and other new IEW systems to establish an inventory of IEW ability and skill requirements.

Four, techniques for determining the compatibility between various MOS ability and skill profiles and IEW system requirements profiles must be extended. If these activities prove successful, JAAS will be available for immediate USAICS use in MI personnel decision making.

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Appendix A  
Job Abilities Assessment System, Part 1

J A A S

J O B   A B I L I T I E S   A S S E S S M E N T   S Y S T E M

N o v e m b e r   1 9 8 9

## INTRODUCTION

The Job Abilities Assessment System (JAAS) is a method for picking out the underlying human abilities that are required to perform different kinds of specific work and human tasks. You will be given a description of a job or task and a flow diagram procedure. Using the procedure, you will decide which of 52 basic human abilities are needed for the specific job or task.

With the list of abilities you extract, important personnel decisions can be made in such areas as:

- o Personnel selection
- o Personnel training
- o Job descriptions, and
- o Human work performance standards.

The present version of JAAS is built on the work of Dr. Edwin A. Fleishman and his associates. If you wish to read more about how the specific technique is used, read:

Mallamud, S.M., Levine, J.M., and Fleishman, E.A. (1980) Identifying ability requirements by decision flow diagrams. Human Factors, 22(1), 57-68.

If you would like more general information, try:

Fleishman, E.A., and Quaintance, M.K. (1984) Taxonomies of human performance: The description of human tasks. Orlando: Academic Press.



## INSTRUCTIONS

To use JAAS, you have been given four tools: a detailed job or task description, a set of flow diagrams, a blank answer sheet, and a sample task ("Driving") on which to practice.

1. PLEASE READ THE DETAILED JOB OR TASK DESCRIPTION VERY CAREFULLY. You are going to break down that job or task in terms of the human abilities required to perform the job or task effectively. Keep the job or task description easily available; you may go back to it at any time.

2. The flow diagrams will help you decide whether or not an ability is present in the job or task. The system will present sequential questions which you will answer "YES" or "NO". Whichever your answer-- "YES" or "NO"-- follow the appropriate line either to the next box or to a "GO TO \_\_\_" instruction. One of four things will happen:

- a. A box will have a question to which you must answer "YES" or "NO", or
- b. A box will have a capitalized name (for example, "NEAR VISION") for the ability you have picked which then should be circled on your answer sheet (see Step 3), or
- c. A "GO TO \_\_\_" instruction will send you to the next number (for example, "204") in a circle on the left of the page, or
- d. An unmarked line may take you from an "ABILITY" box to another question or to a "GO TO \_\_\_" number.

3. A separate answer sheet has been provided which lists all 52 abilities numbered and in the same order as given in the flow diagrams. When you pick an ability on the flow diagrams (step 2.b), circle that ability name on the answer sheet. Be sure that the name and number you circle match the ability you picked. Please do not write on the flow diagrams.

4. To give you some practice, the first task will be that of ordinary driving. The sample task description is given on the next page. Read the sample carefully, get out an answer sheet, and then start going through the flow diagrams. When the questions lead you to an ability, circle that ability on the answer sheet.

There are no "right" answers to this sample, but when you finish look at the list of abilities you have circled. See if you think they are abilities that drivers would need for the task as it was described. Are there abilities circled that maybe should not be, or did you miss some abilities? If you are in doubt, go back and reread the appropriate questions in the flow diagrams. You may change your judgments if you think you should.

Sample Task: DRIVING

A 21-year old female student is going to drive a 1968 Chevrolet Impala during rush hour traffic (approximately 5:30). The trip will begin at the University of Maryland and will end at the Hecht Co., in Silver Spring, Maryland. This car that she will be driving has a manual transmission (4 speed stick shift) and power steering but no power brakes.

She unlocks her car, gets in and turns the ignition on. Before backing up she fastens her seat belt and turns the radio on. She backs out of her parking space in Lot 1 and makes a right turn onto University Blvd. Next, she makes a right turn onto the approach to Route 1 and proceeds toward the Capital Beltway. Frequent stops and starts are made on the way to the Beltway because traffic is heavy. Upon arriving at the Beltway, she must quickly pull out from the ramp to get into the main traffic stream.

She is driving in the right lane at 50 mph and notices an accident up ahead, so she must quickly pull into the center lane. The rest of the driving on the Beltway is marred by two quick panic stops.

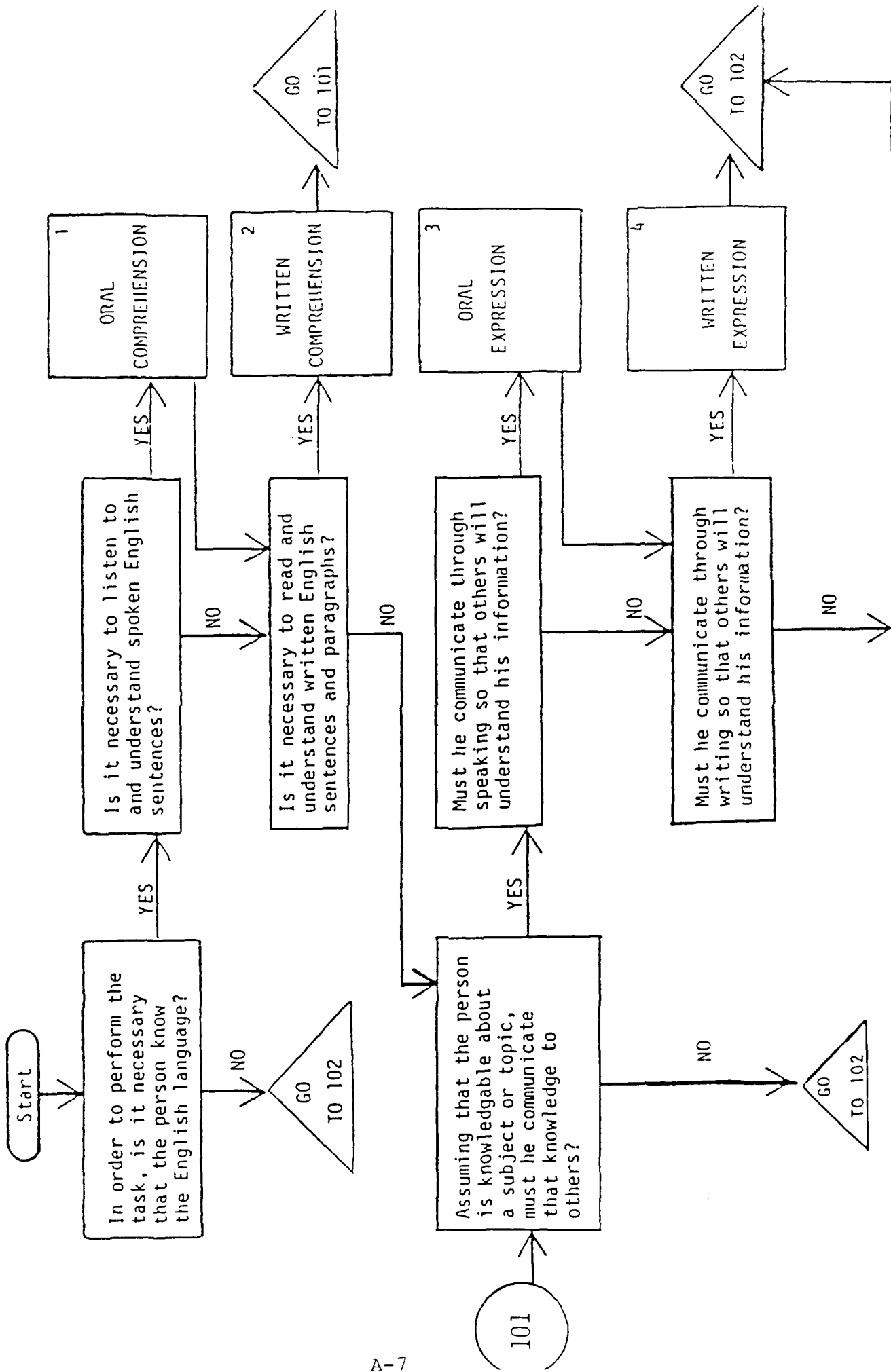
She gets off at Georgia Avenue and continues south toward Silver Spring. She is travelling at 30 mph in light to medium traffic with occasional stops and starts for traffic lights.

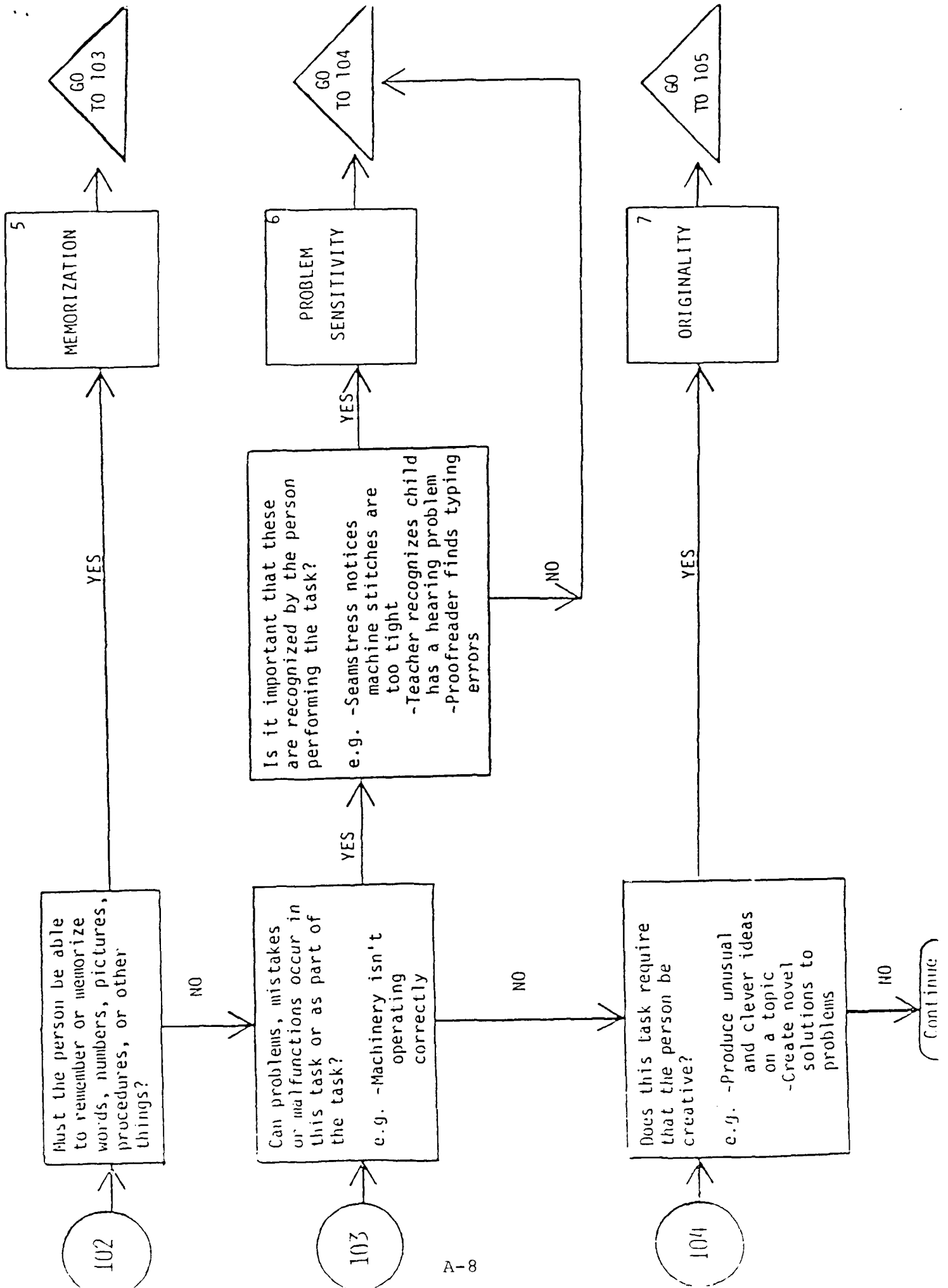
After arriving at the Hecht Co., she finds an empty parking space between two parked cars and must park parallel.

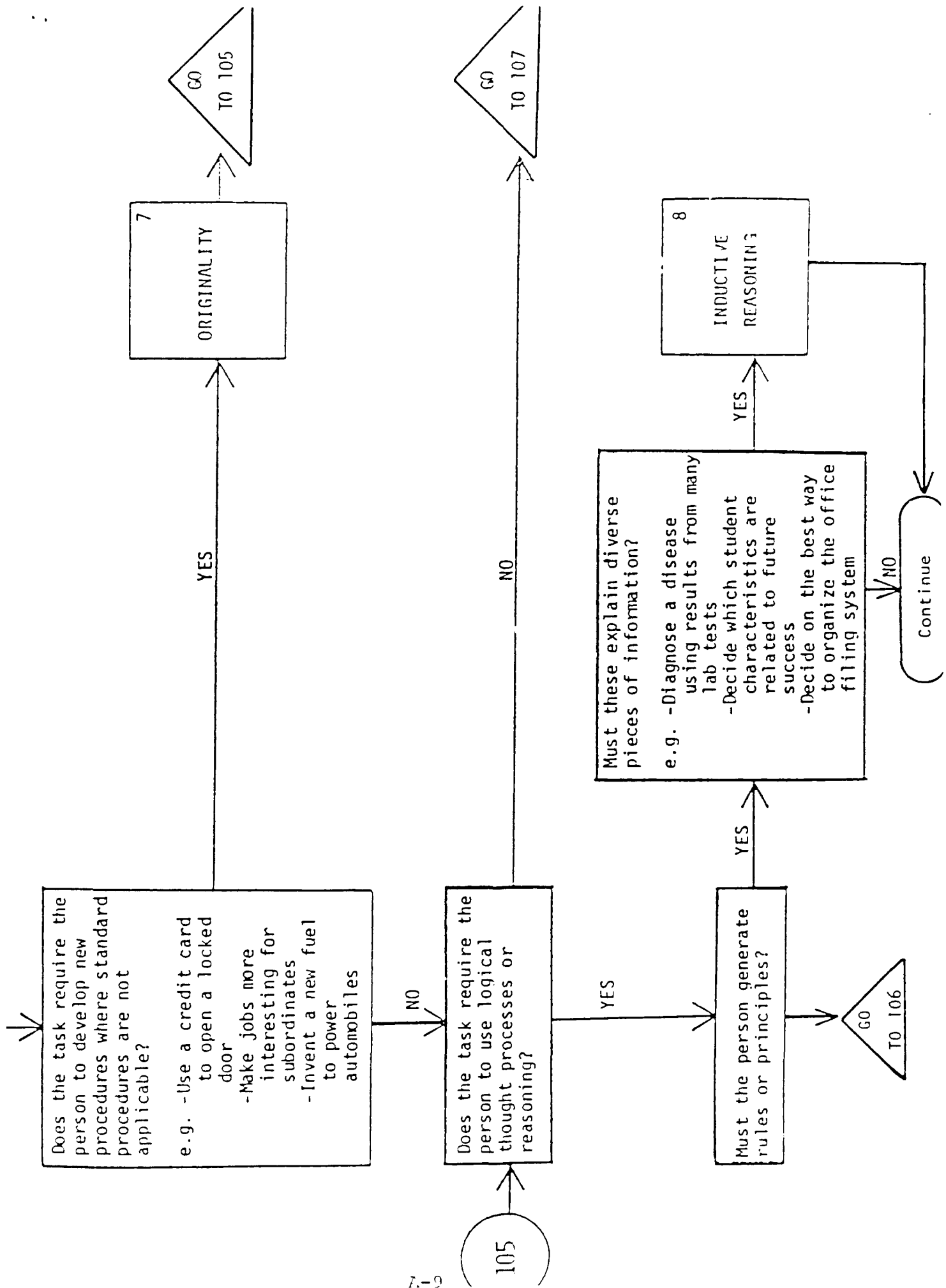
Answer Sheet, Job or Task: \_\_\_\_\_

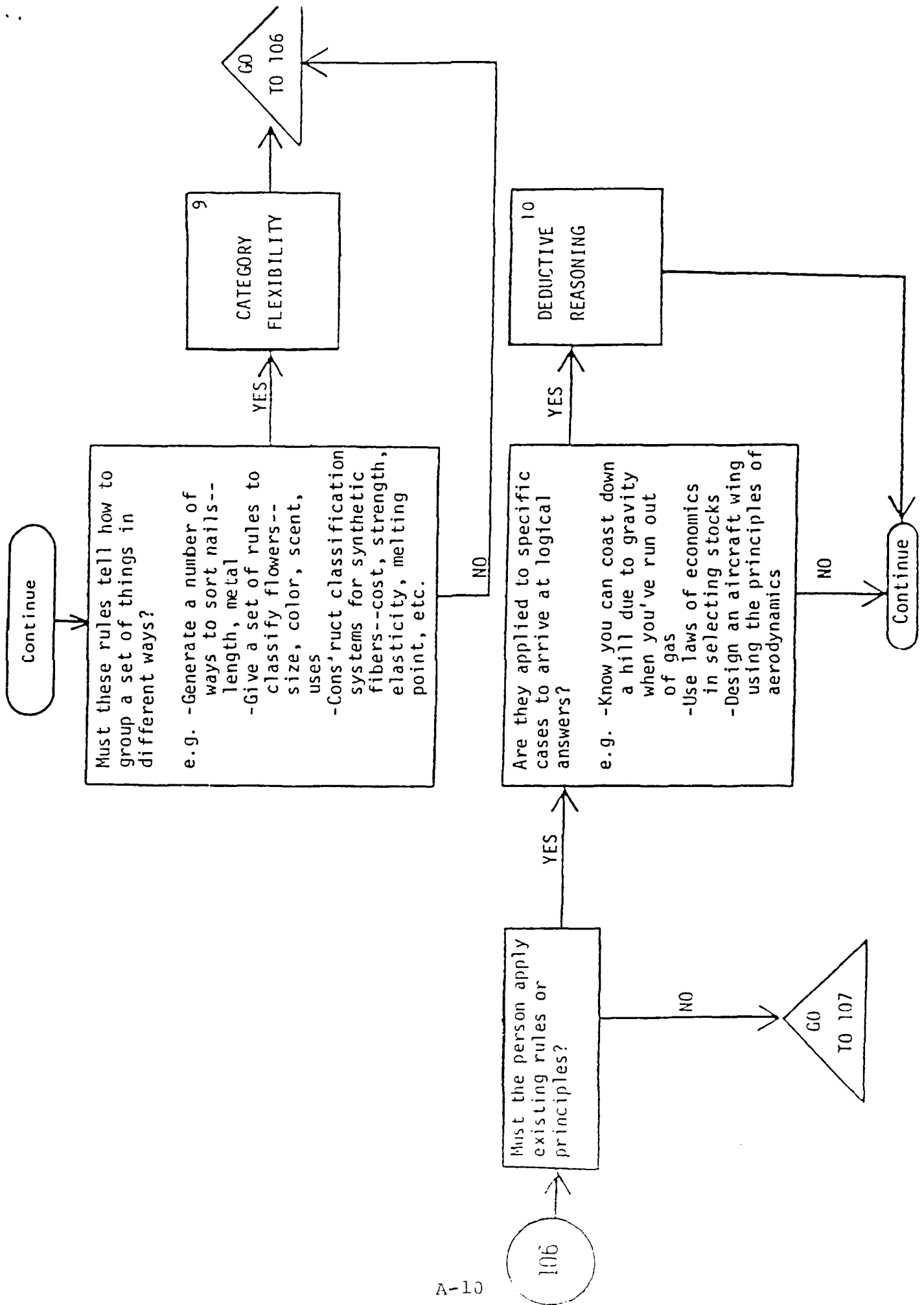
PLEASE CIRCLE THE APPROPRIATE ABILITIES

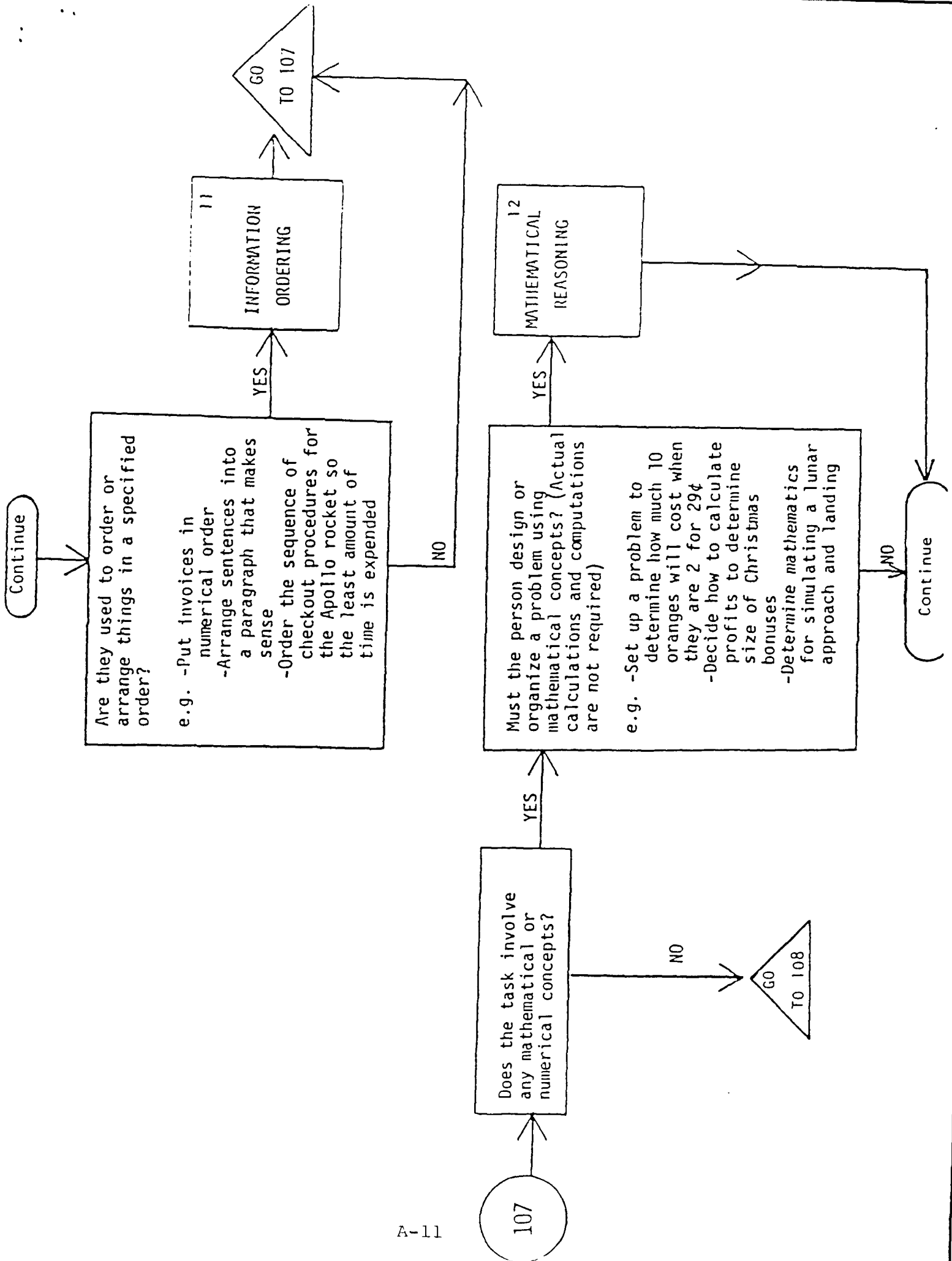
- |                            |                                   |                             |
|----------------------------|-----------------------------------|-----------------------------|
| 1. ORAL COMPREHENSION      | 18. SELECTIVE ATTENTION           | 35. EXPLOSIVE STRENGTH      |
| 2. WRITTEN COMPREHENSION   | 19. PERCEPTUAL SPEED AND ACCURACY | 36. DYNAMIC STRENGTH        |
| 3. ORAL EXPRESSION         | 20. SPATIAL ORIENTATION           | 37. TRUNK STRENGTH          |
| 4. WRITTEN EXPRESSION      | 21. NEAR VISION                   | 38. STAMINA                 |
| 5. MEMORIZATION            | 22. FAR VISION                    | 39. EXTENT FLEXIBILITY      |
| 6. PROBLEM SENSITIVITY     | 23. NIGHT VISION                  | 40. DYNAMIC FLEXIBILITY     |
| 7. ORIGINALITY             | 24. VISUAL COLOR DISCRIMINATION   | 41. GROSS BODY EQUILIBRIUM  |
| 8. INDUCTIVE REASONING     | 25. PERIPHERAL VISION             | 42. SPEED OF LIMB MOVEMENT  |
| 9. CATEGORY FLEXIBILITY    | 26. DEPTH PERCEPTION              | 43. GROSS BODY COORDINATION |
| 10. DEDUCTIVE REASONING    | 27. GLARE SENSITIVITY             | 44. MULTI-LIMB COORDINATION |
| 11. INFORMATION ORDERING   | 28. GENERAL HEARING               | 45. WRIST FINGER SPEED      |
| 12. MATHEMATICAL REASONING | 29. AUDITORY ATTENTION            | 46. FINGER DEXTERITY        |
| 13. NUMBER FACILITY        | 30. SOUND LOCALIZATION            | 47. MANUAL DEXTERITY        |
| 14. FLUENCY OF IDEAS       | 31. SPEECH HEARING                | 48. ARM HAND STEADINESS     |
| 15. TIME SHARING           | 32. SPEECH CLARITY                | 49. CONTROL PRECISION       |
| 16. FLEXIBILITY OF CLOSURE | 33. VISUALIZATION                 | 50. RATE CONTROL            |
| 17. SPEED OF CLOSURE       | 34. STATIC STRENGTH               | 51. REACTION TIME           |
|                            |                                   | 52. CHOICE REACTION TIME    |



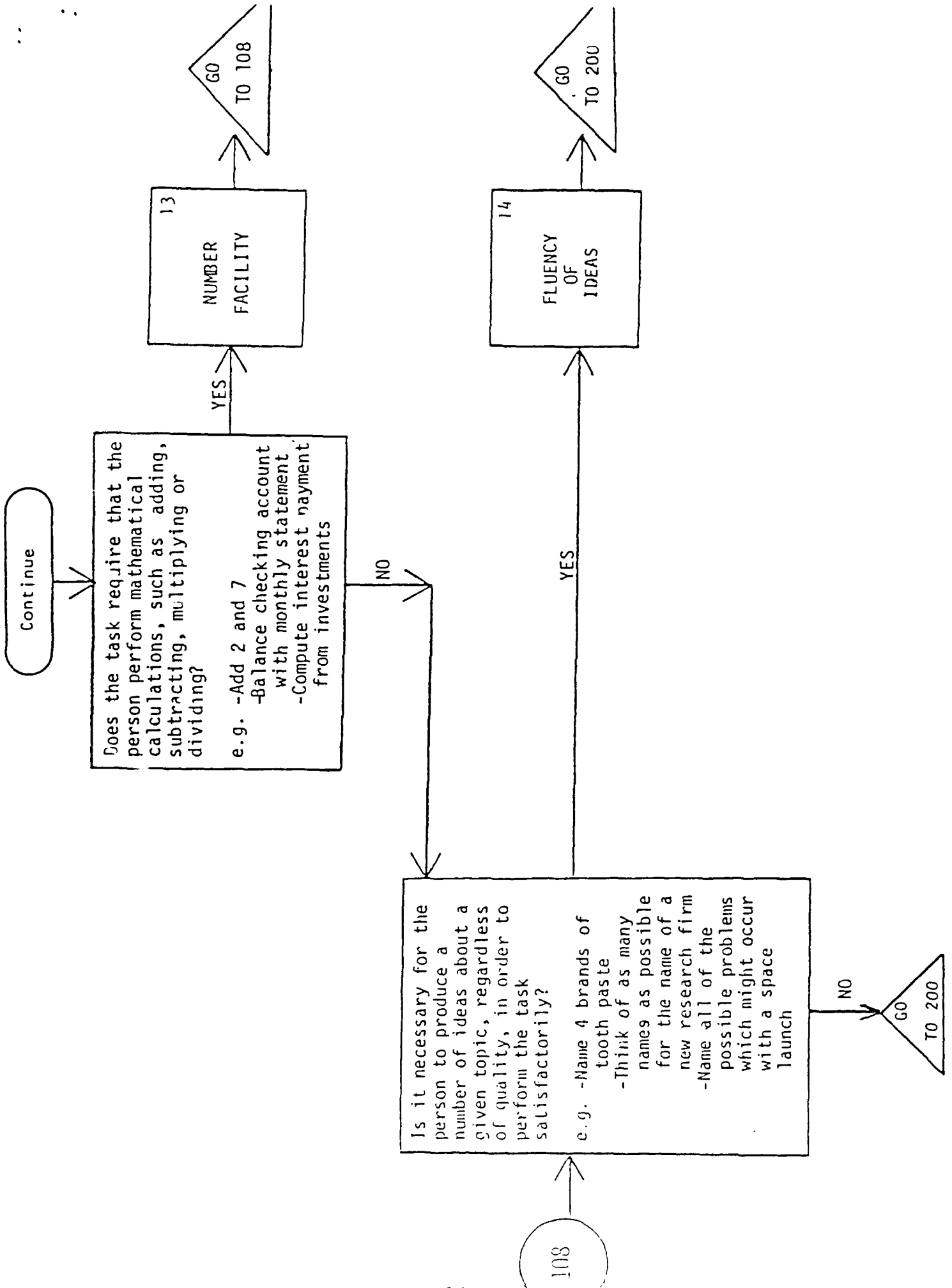


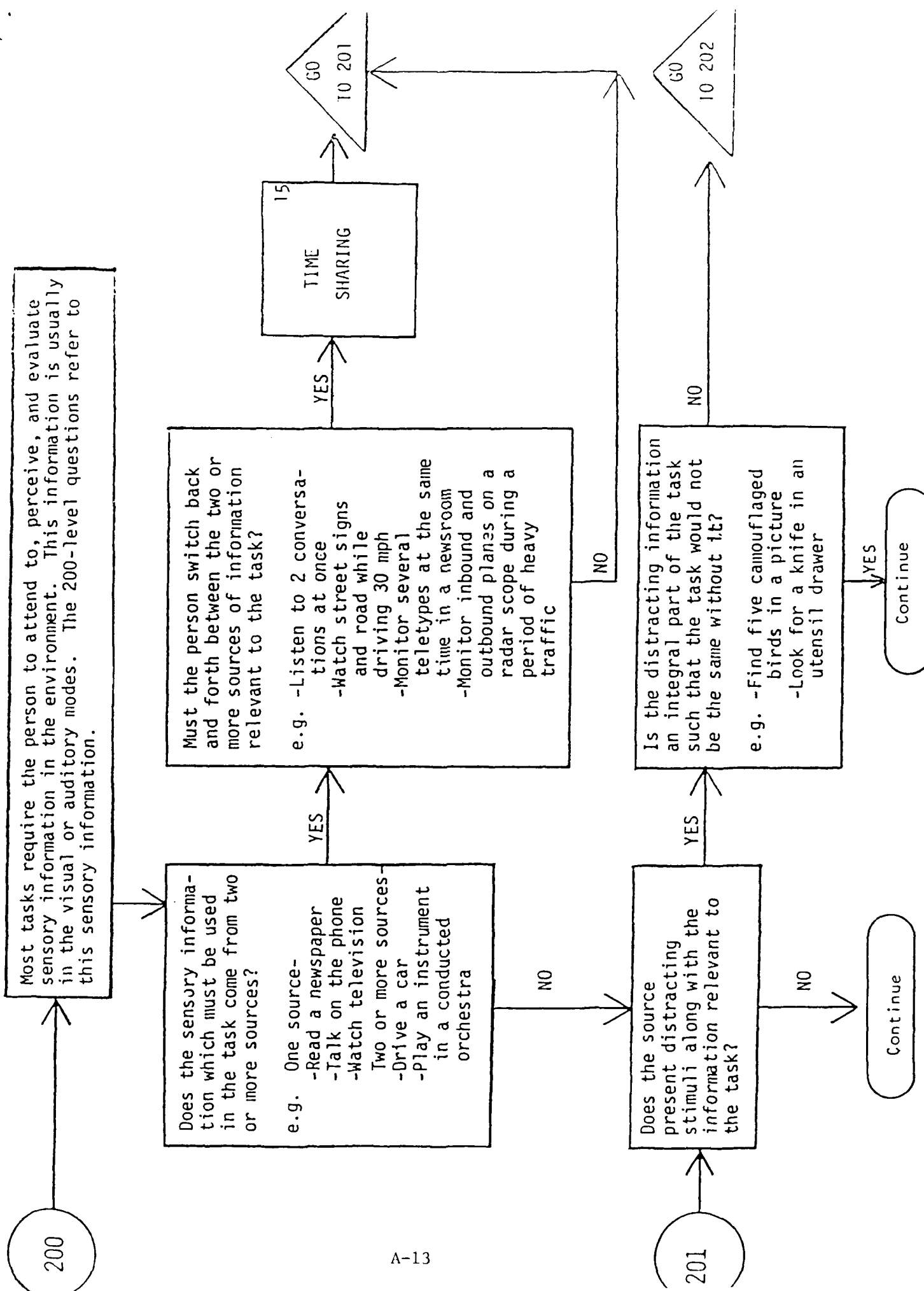


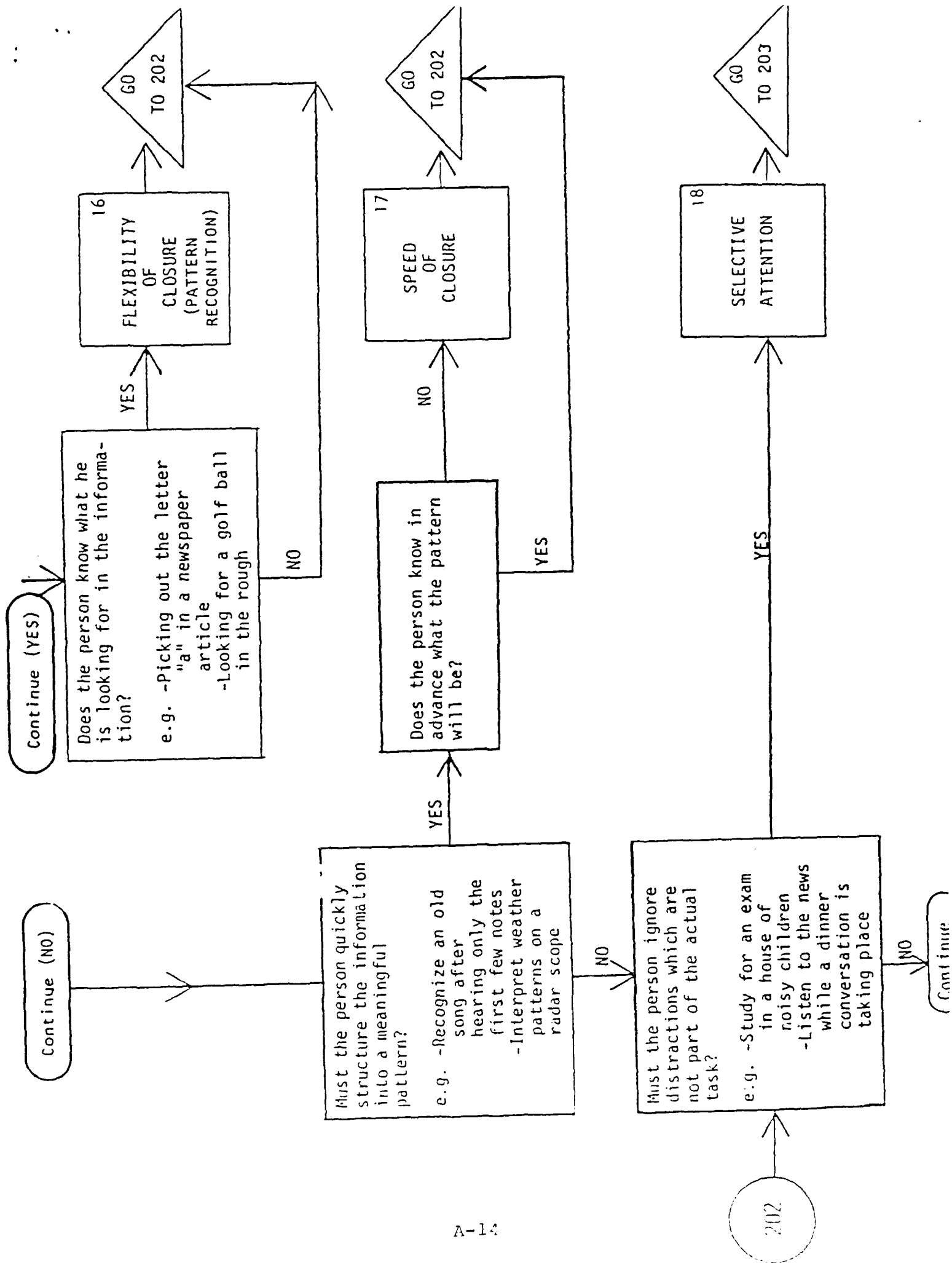


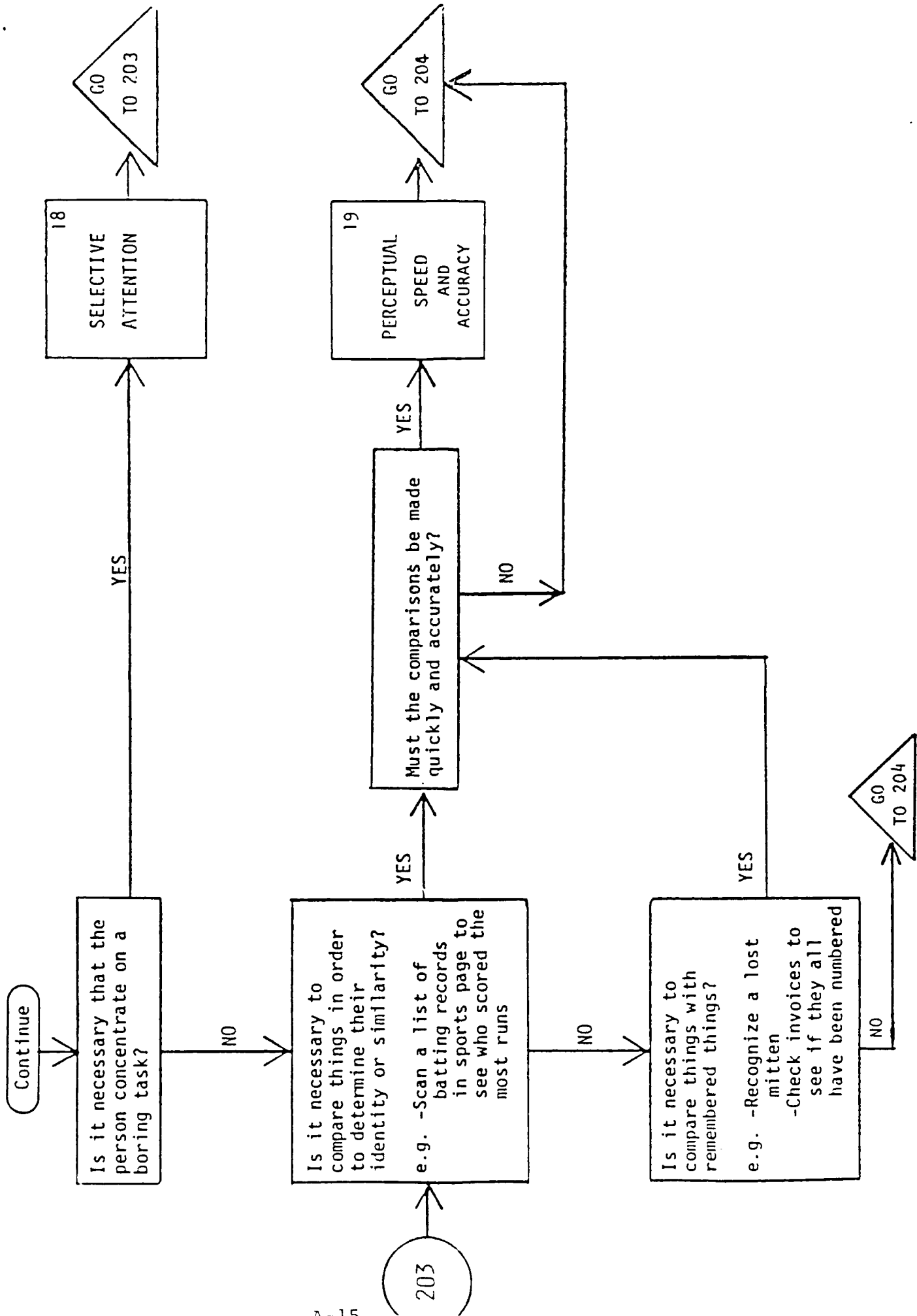


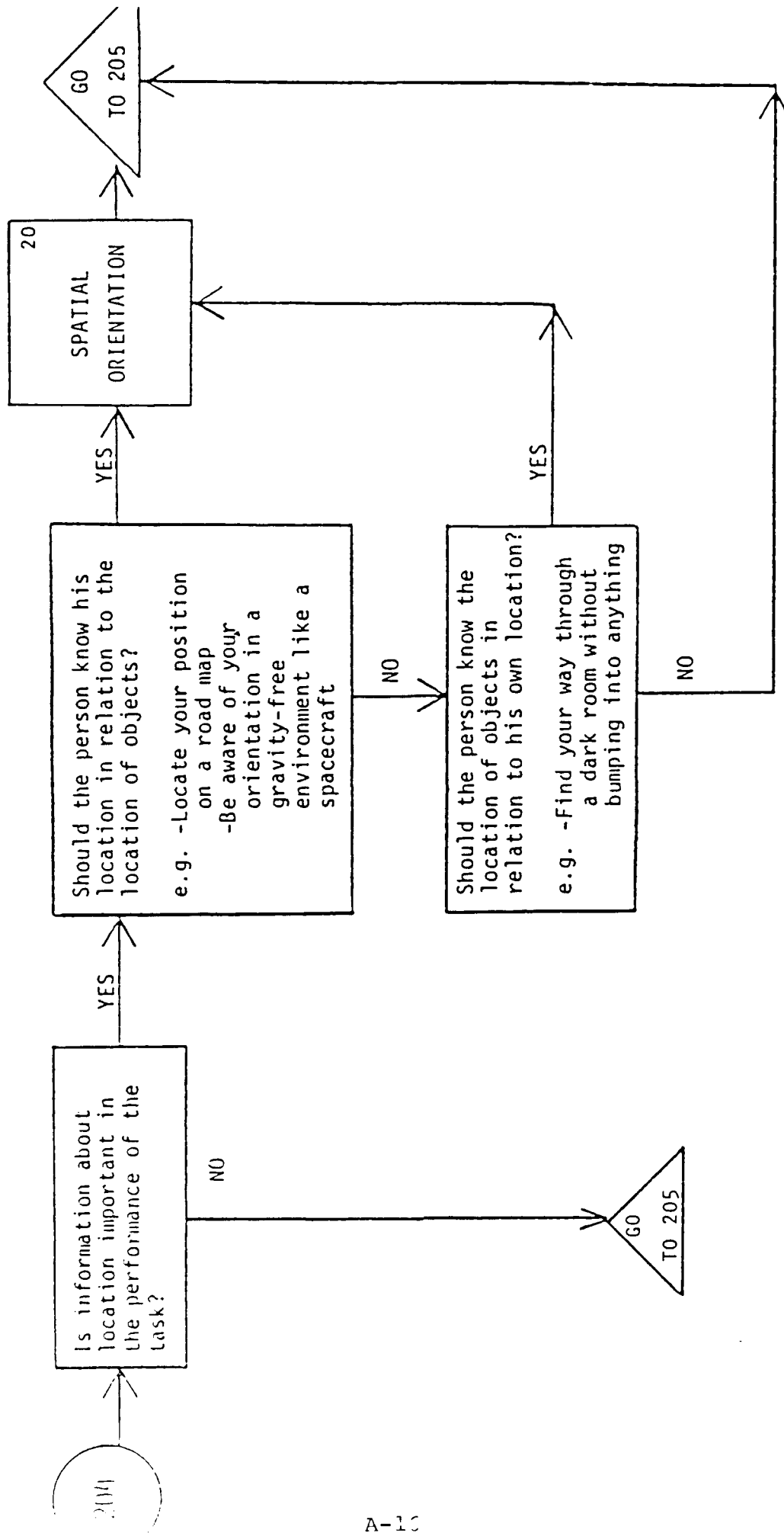


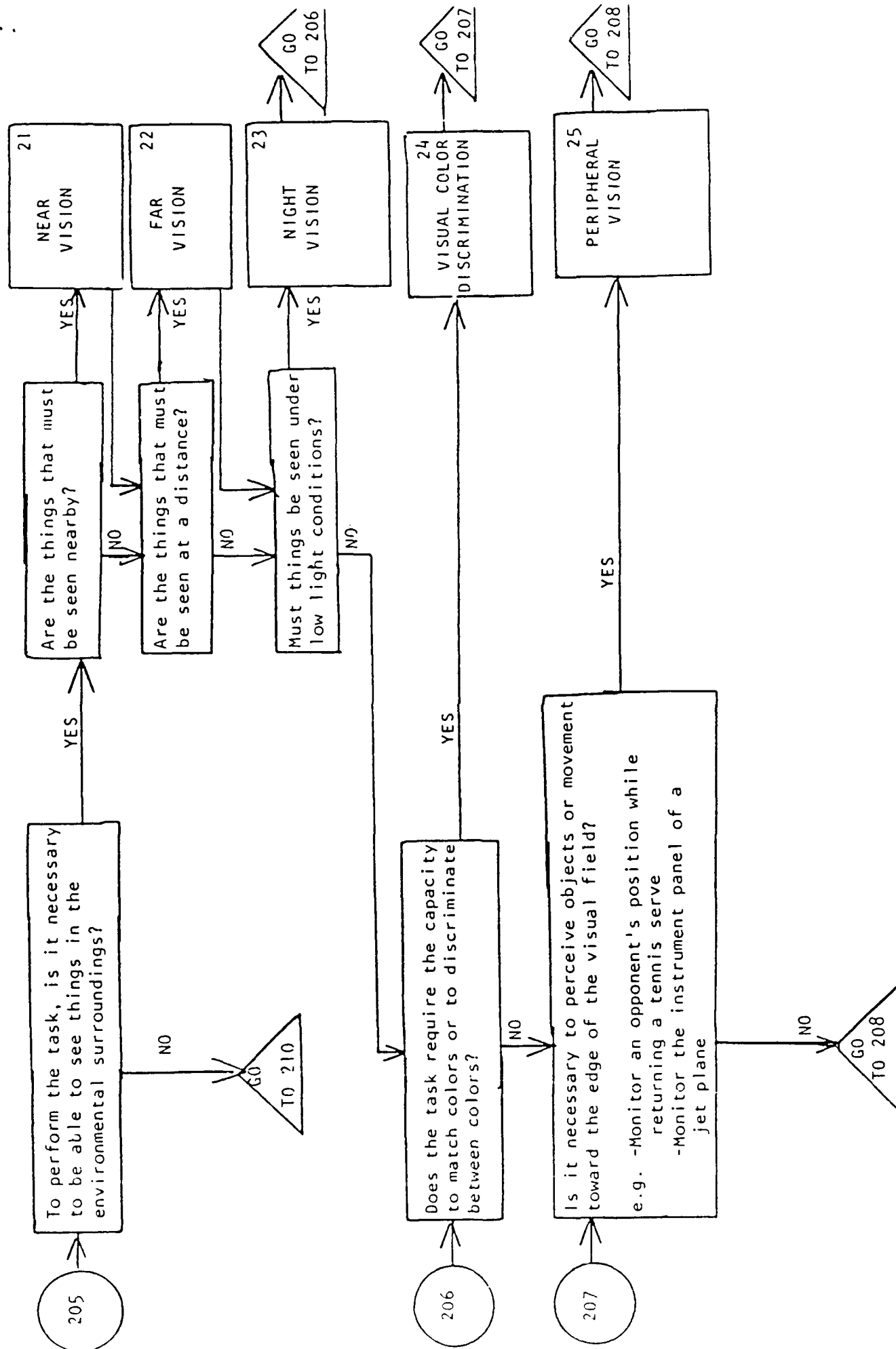


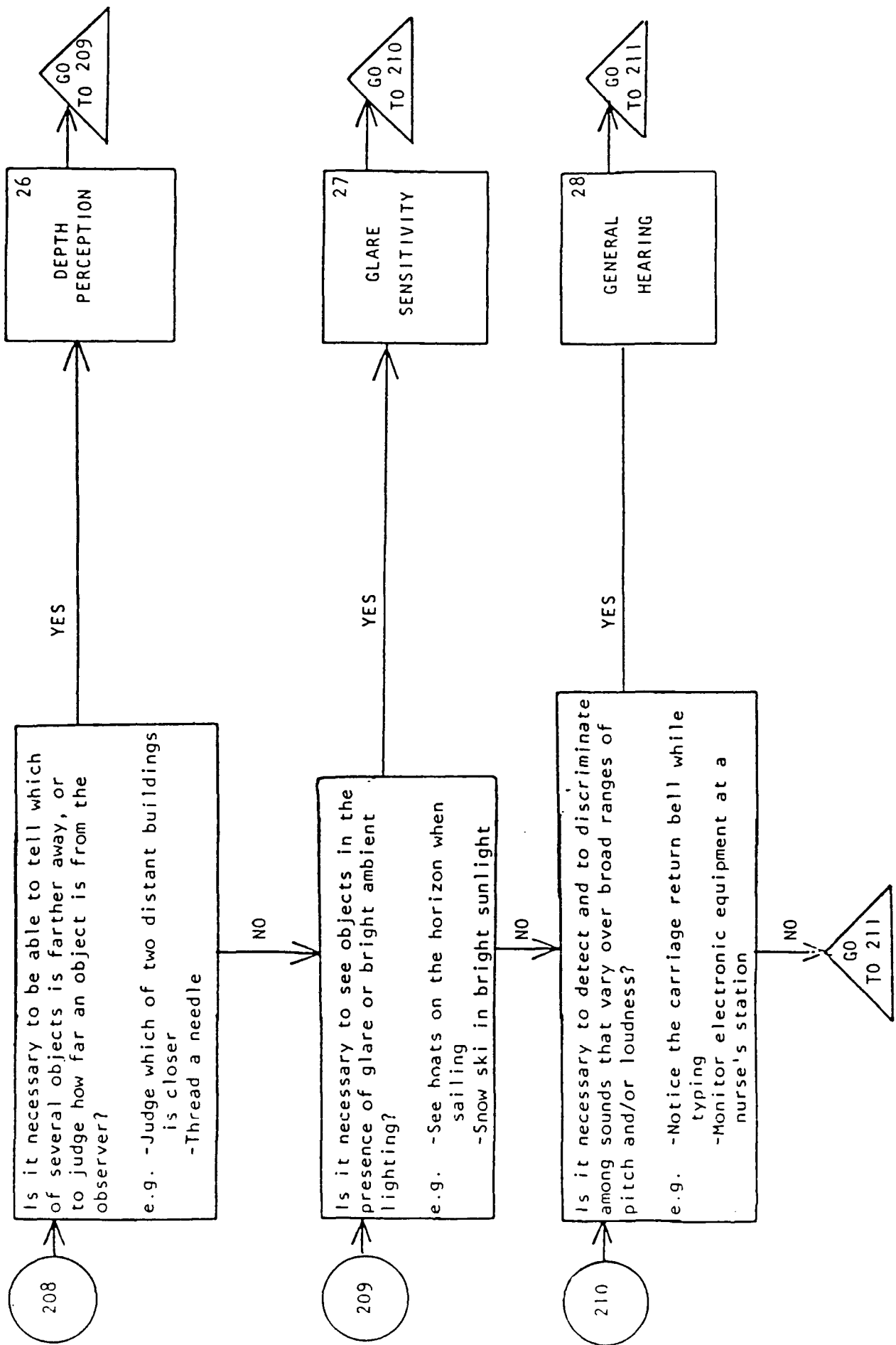


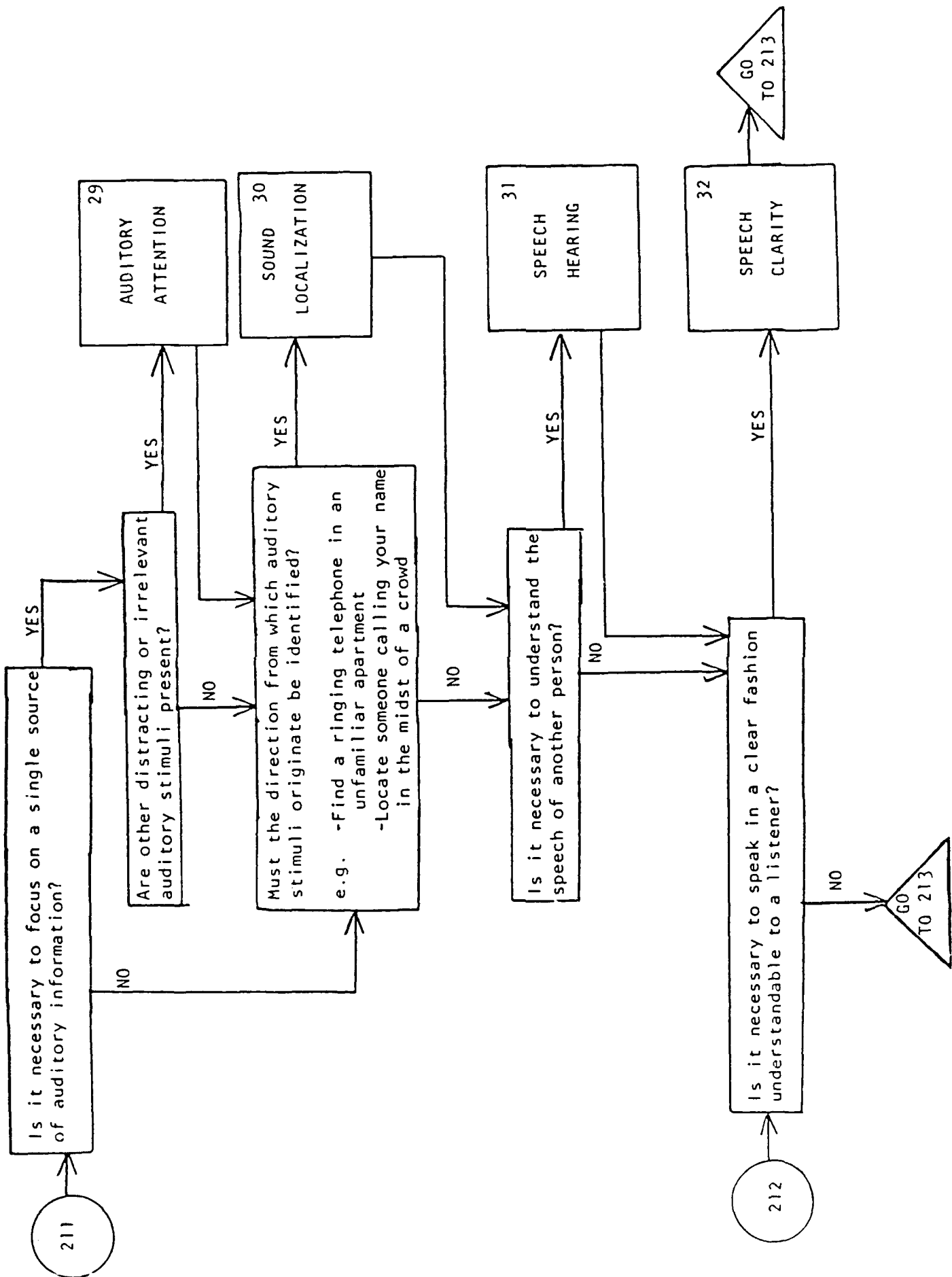








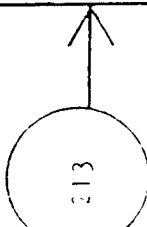






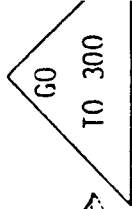
Does the task require that the person be able to form mental images of how something will look after it is moved around or its parts have been re-arranged?

e.g. -Imagine how to put paper in a type-writer so letter-head comes out on top  
-Imagine how to cut and fold a piece of paper to make a cube  
-Anticipate future moves in a chess game



YES

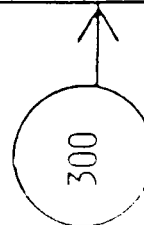
33  
VISUALIZATION



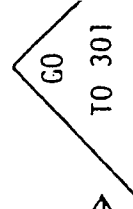
NO

Does the task require the person to use a significant amount of physical/muscle strength?

e.g. -Push, pull, throw, or move an object or one's body

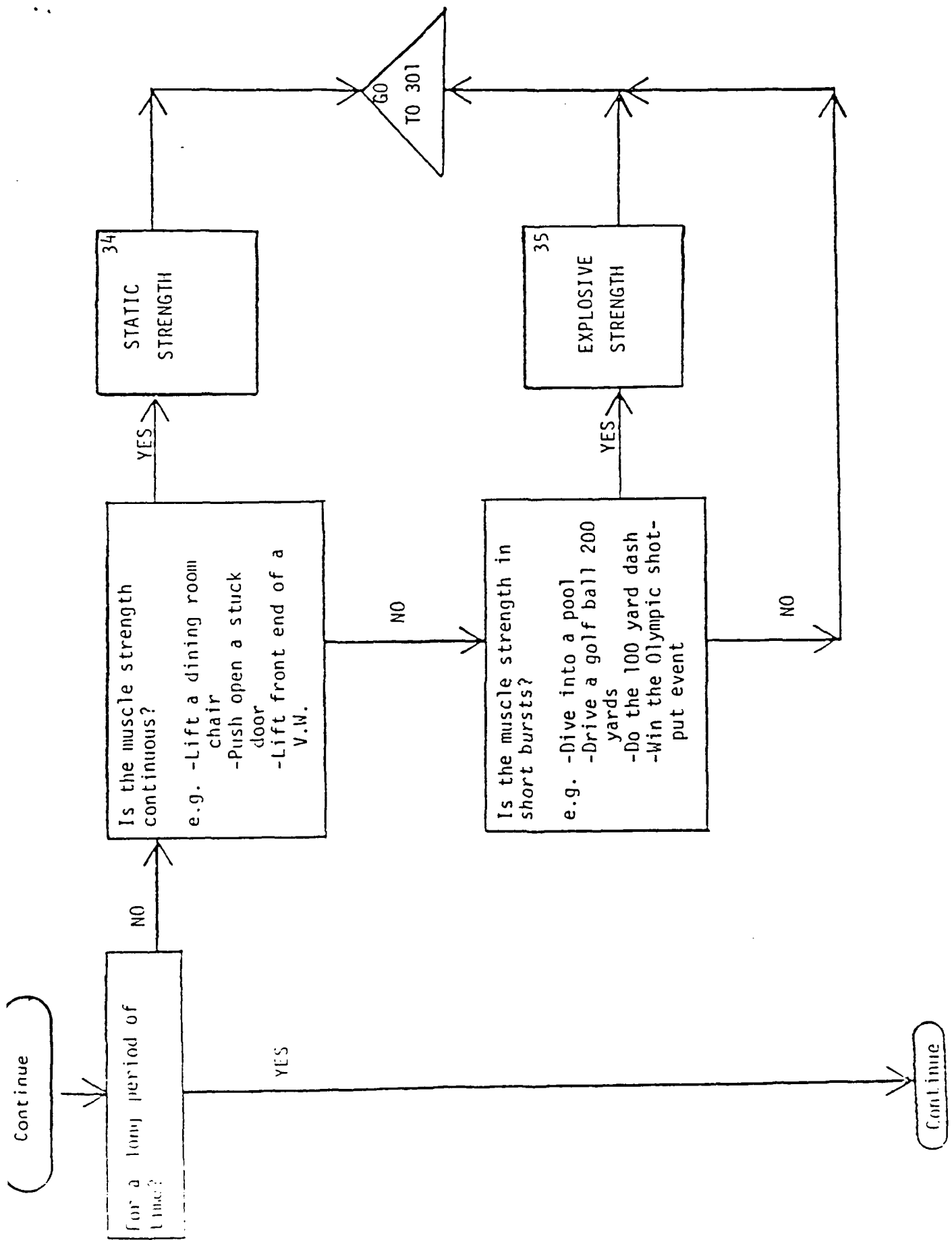


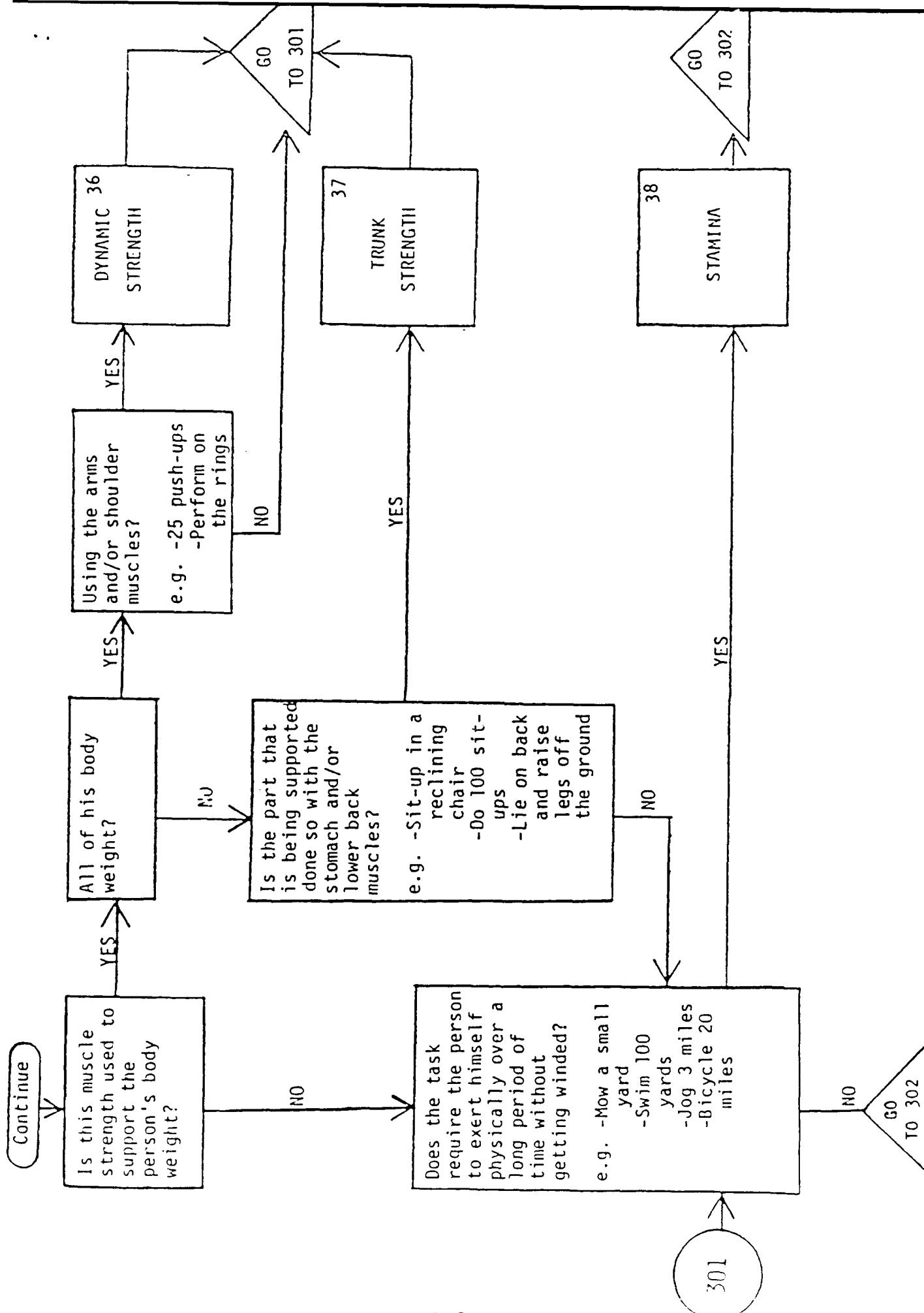
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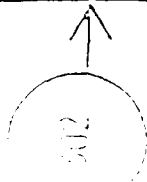
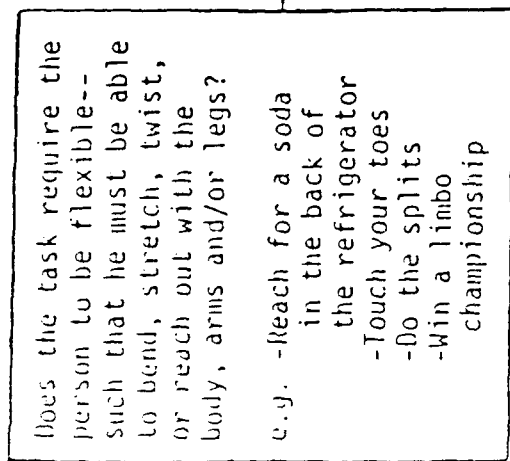


YES

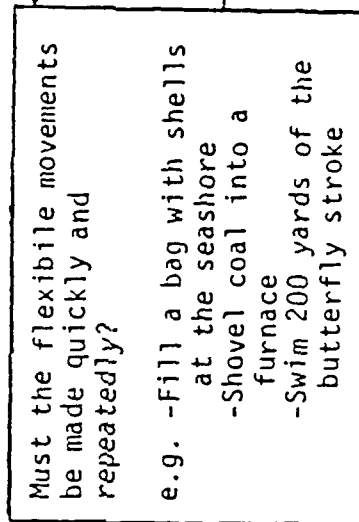
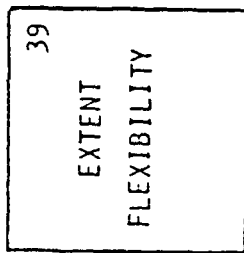
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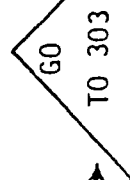
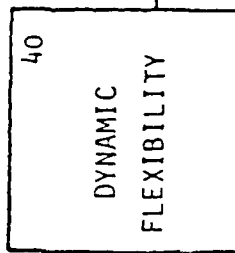




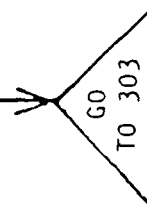
YES



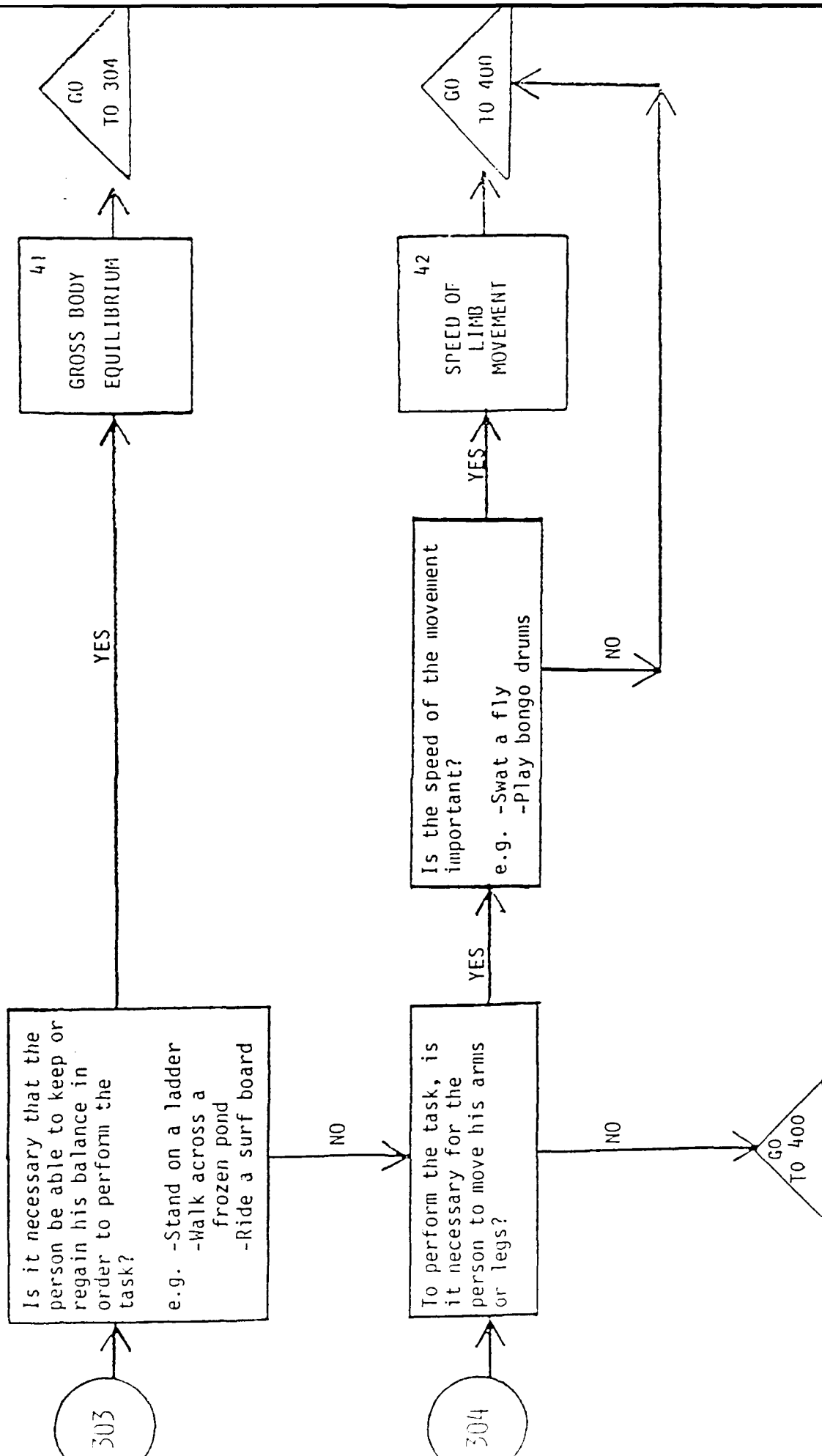
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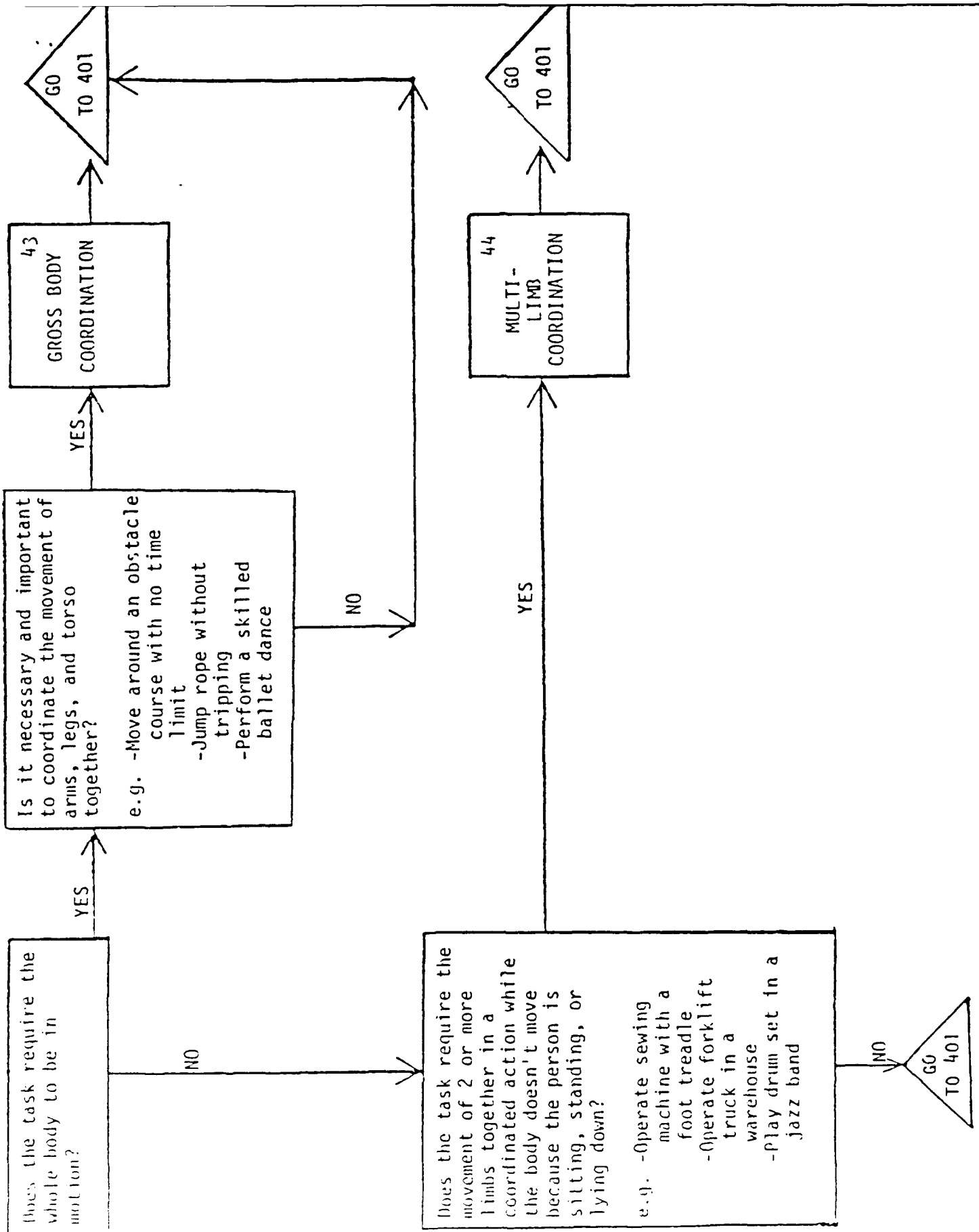


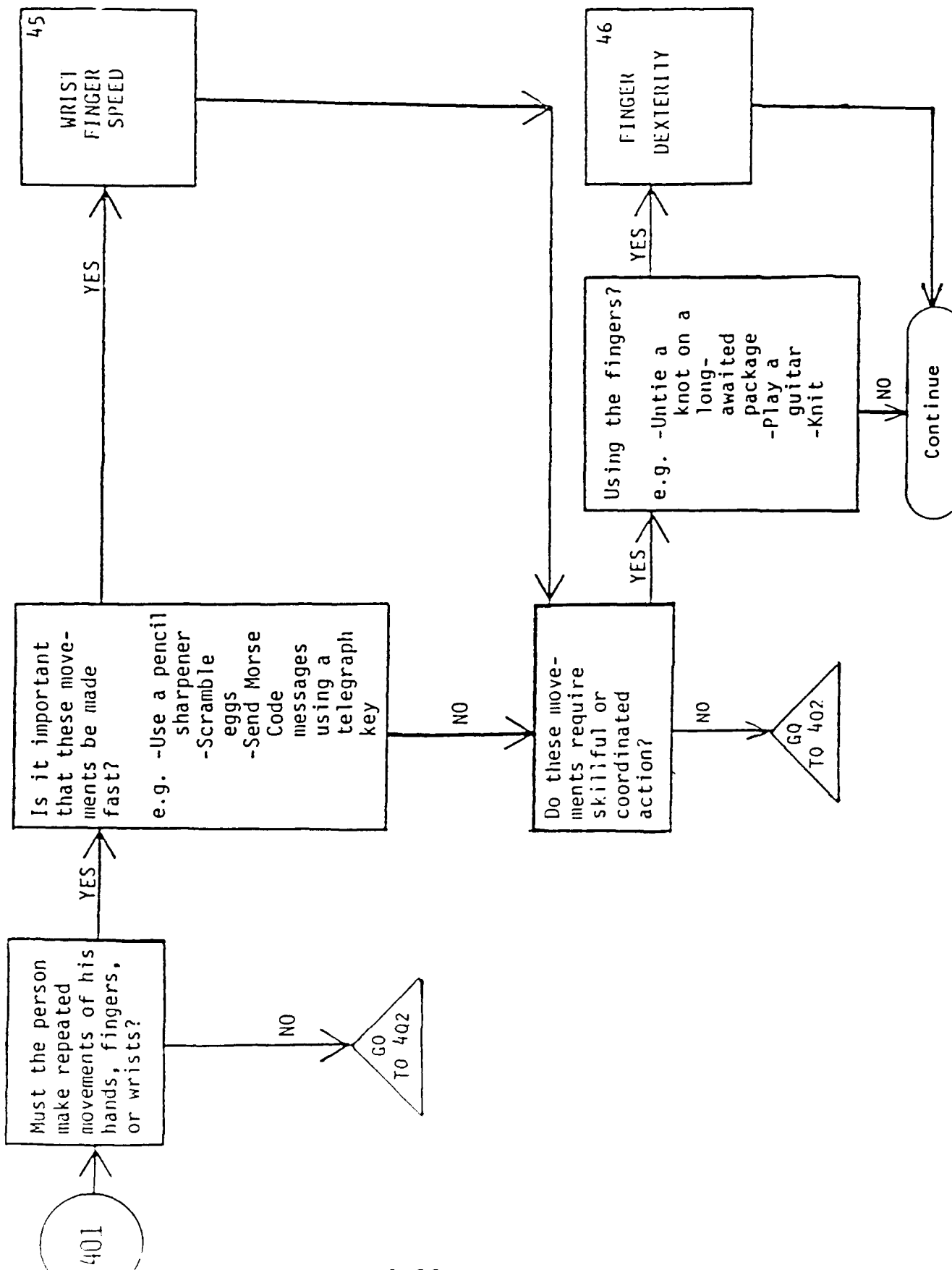
NO

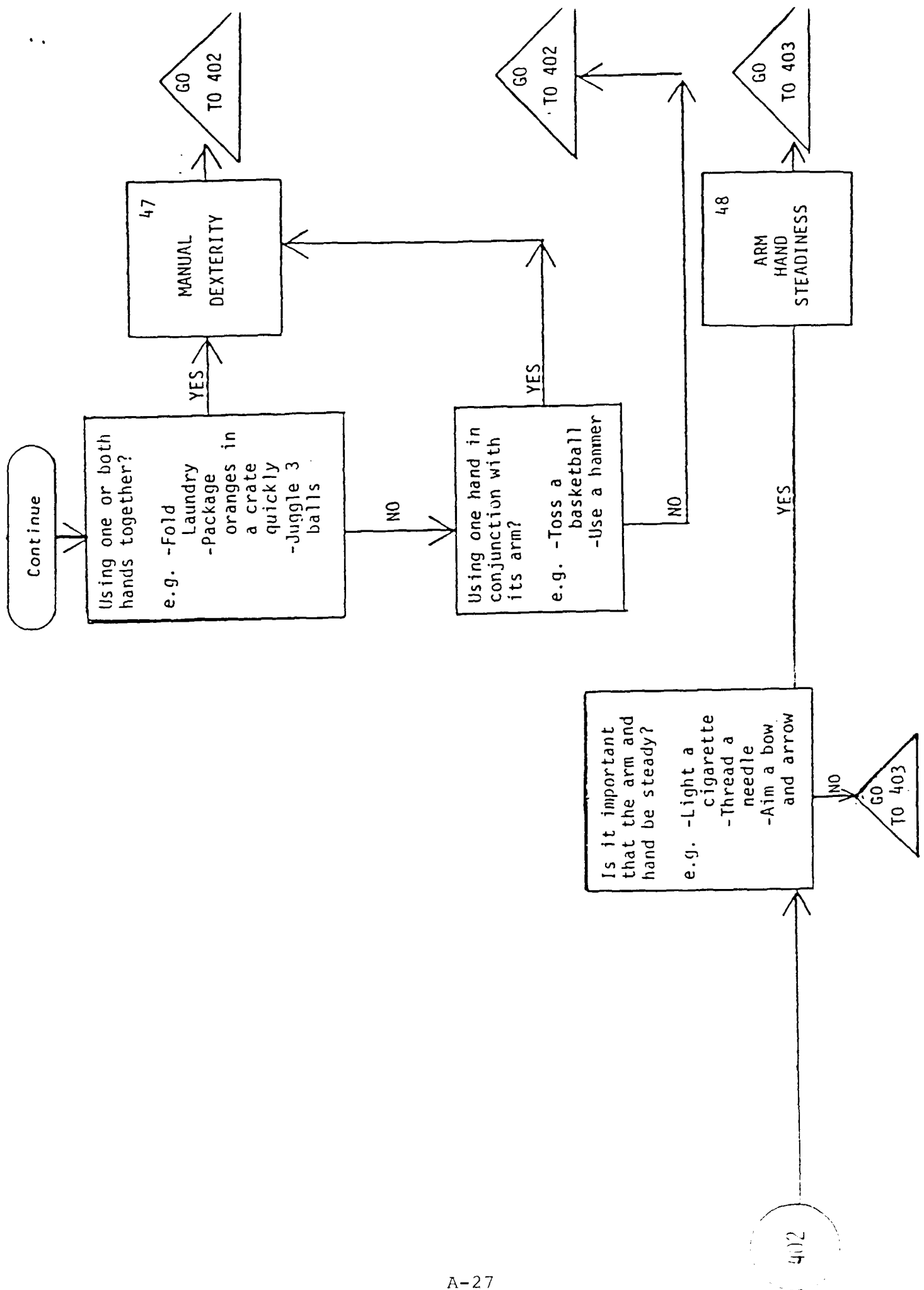


NO

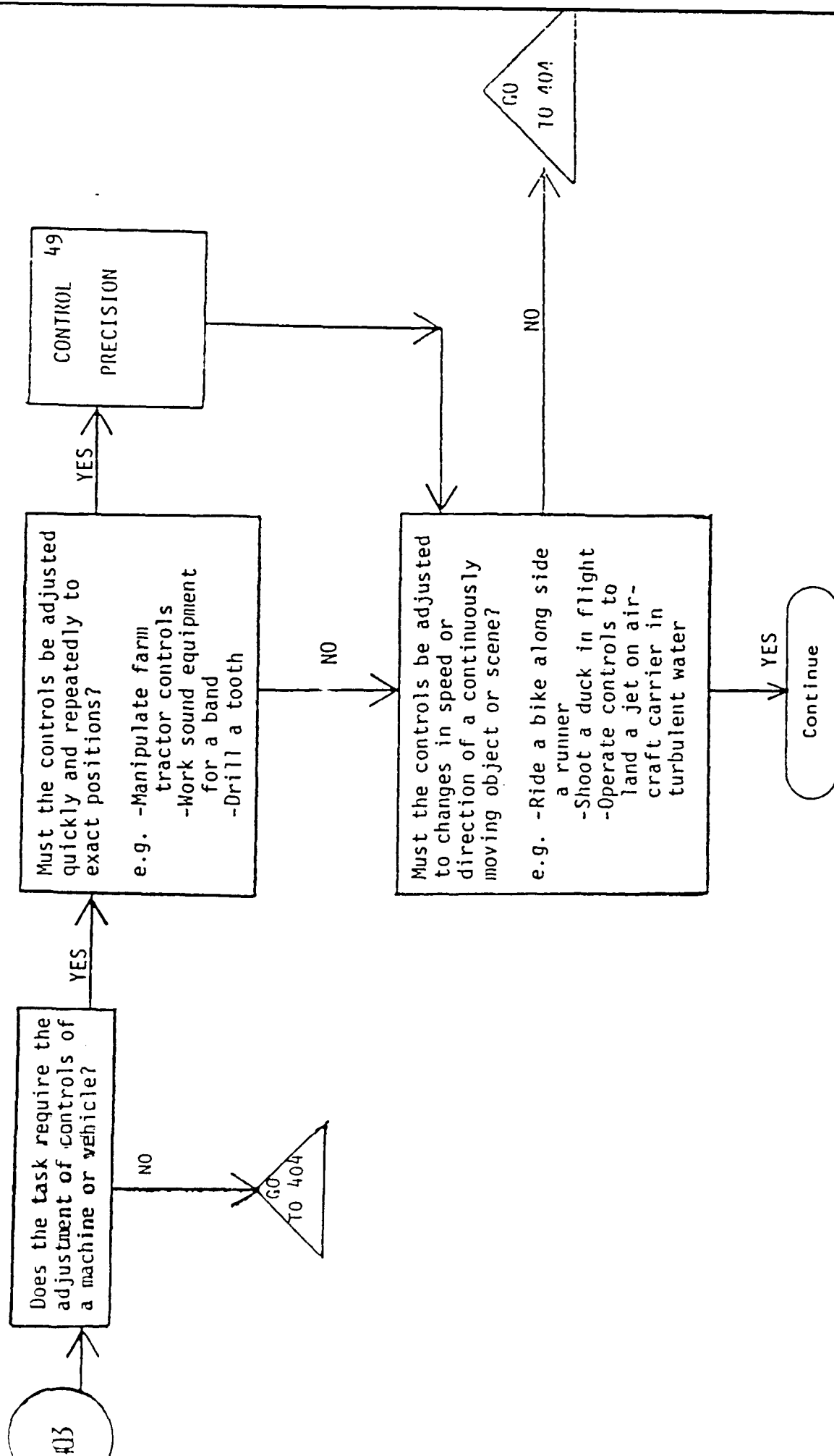


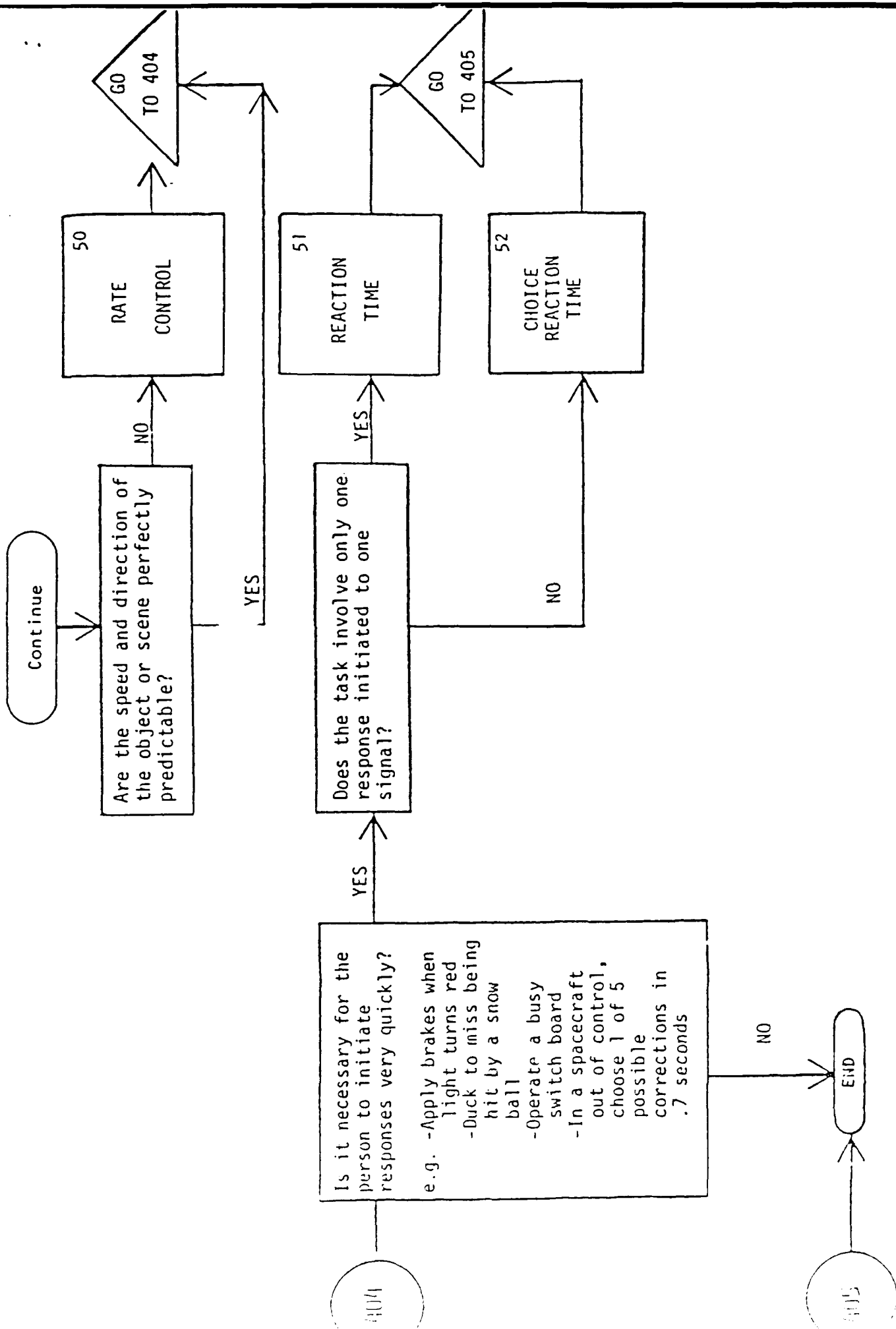












Appendix B

Job Abilities Assessment System, Part 2

JAAS

JOB ABILITIES ASSESSMENT SYSTEM

PART 2

November 1989

## INTRODUCTION

In using Part 1 of the Job Abilities Assessment System (JAAS), you identified those abilities that you felt were necessary to perform a specific job or task. Now, in Part 2, you will be asked to estimate how much of the ability is needed for the task. That is, must the ability be at a high level of complex understanding and skill or is a basic knowledge and elementary exercise of the ability sufficient? You are going to estimate the level of ability required for the task with a number.

By indicating how much of the ability is needed in the task, you will suggest some of the answers to important personnel decisions in several areas:

- a. Personnel selection
- b. Personnel training
- c. Personnel skill requirements
- d. Job descriptions
- e. Human work performance standards.

JAAS, Parts 1 and 2, is built on the work of Dr. Edwin A. Fleishman and his associates. If you wish to read more about how the specific technique is used, read:

Mallamad, S.M., Levine, J.M., and Fleishman, E.A. (1980) Identifying ability requirements by decision flow diagrams. Human Factors, 22(1), 57-68.

If you would like more general information, try:

Fleishman, E.A. and Quaintance, M.K. (1984) Taxonomies of human performance: The description of human tasks. Orlando: Academic Press.

Chapter 12 (pages 306-353) describes the ABILITY REQUIREMENTS APPROACH which is the name of the method being used here.

## INSTRUCTIONS

In Part I of the JAAS you selected the abilities which you felt were necessary in performing a specific job or task. Now, you will estimate HOW MUCH of that ability is needed. To do that, you have been given three tools: the job or task description, scales for each of the 52 abilities, and blank answer sheets.

1. Reread the job or task description included in the right hand pocket of this package. Feel free to refer back to it at any time.
2. Take out two blank answer sheets from the right hand pocket, one for abilities 1-26 and one for abilities 27-52. The abilities you selected as necessary for performing the task should be marked or checked on the answer sheets. If it has not already been done, do it now using your Part I answer sheet. Only those abilities you picked will need number estimates.
3. Go the following pages of this booklet and find the first ability you picked. The definition of the ability is given on the top of the page.
4. ESTIMATE, USING A NUMBER FROM 1-7, HOW MUCH OF THIS ABILITY IS NEEDED FOR THE JOB OR TASK.
  - a. The more important and the more complicated the use of the ability in the job or task, the larger the number should be-- up to 7.
  - b. The less important and less complicated the use of the ability in the job or task, the smaller the number should be-- down to 1.
  - c. Three examples are shown for each ability to suggest different levels of the ability needed for sample tasks.
  - d. Estimate to the first decimal such as "3.7", or "1.2" or "6.5".
  - e. Write that number in the blank after the ability name on the answer sheet. (Please do not write on the definition and scale sheets themselves.)
5. Repeat the scoring process for all the abilities you picked for this job or task.

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK?

Please Write Your Number Estimate After the Appropriate Ability

Example: "24, VISUAL COLOR DISCRIMINATION 3.0 "

1. ORAL COMPREHENSION	_____	14. FLUENCY OF IDEAS	_____
2. WRITTEN COMPREHENSION	_____	15. TIME SHARING	_____
3. ORAL EXPRESSION	_____	16. FLEXIBILITY OF CLOSURE	_____
4. WRITTEN EXPRESSION	_____	17. SPEED OF CLOSURE	_____
5. MEMORIZATION	_____	18. SELECTIVE ATTENTION	_____
6. PROBLEM SENSITIVITY	_____	19. PERCEPTUAL SPEED & ACCURACY	_____
7. ORIGINALITY	_____	20. SPATIAL ORIENTATION	_____
8. INDUCTIVE REASONING	_____	21. NEAR VISION	_____
9. CATEGORY FLEXIBILITY	_____	22. FAR VISION	_____
10. DEDUCTIVE REASONING	_____	23. NIGHT VISION	_____
11. INFORMATION ORDERING	_____	24. VISUAL COLOR DISCRIMINATION	_____
12. MATHEMATICAL REASONING	_____	25. PERIPHERAL VISION	_____
13. NUMBER FACILITY	_____	26. DEPTH PERCEPTION	_____

Job or Task: \_\_\_\_\_

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK?

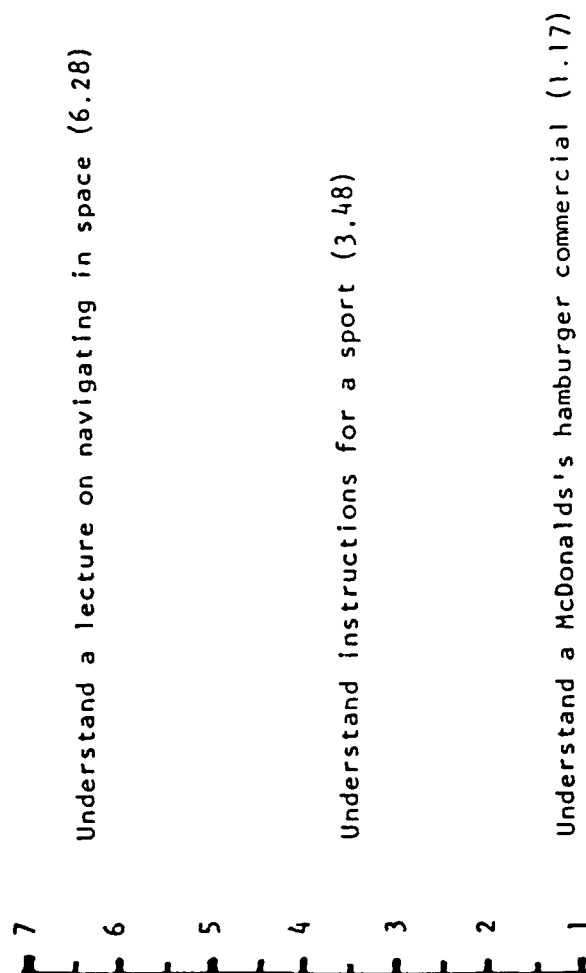
Please Write Your Number Estimate After the Appropriate Ability

Example: "34. STATIC STRENGTH 1.5"

27. GLARE SENSITIVITY	_____	40. DYNAMIC FLEXIBILITY	_____
28. GENERAL HEARING	_____	41. GROSS BODY EQUILIBRIUM	_____
29. AUDITORY ATTENTION	_____	42. SPEED OF LIMB MOVEMENT	_____
30. SOUND LOCALIZATION	_____	43. GROSS BODY COORDINATION	_____
31. SPEECH HEARING	_____	44. MULTI-LIMB COORDINATION	_____
32. SPEECH CLARITY	_____	45. WRIST FINGER SPEED	_____
33. VISUALIZATION	_____	46. FINGER DEXTERITY	_____
34. STATIC STRENGTH	_____	47. MANUAL DEXTERITY	_____
35. EXPLOSIVE STRENGTH	_____	48. ARM HAND STEADINESS	_____
36. DYNAMIC STRENGTH	_____	49. CONTROL PRECISION	_____
37. TRUNK STRENGTH	_____	50. RATE CONTROL	_____
38. STAMINA	_____	51. REACTION TIME	_____
39. EXTENT FLEXIBILITY	_____	52. CHOICE REACTION TIME	_____

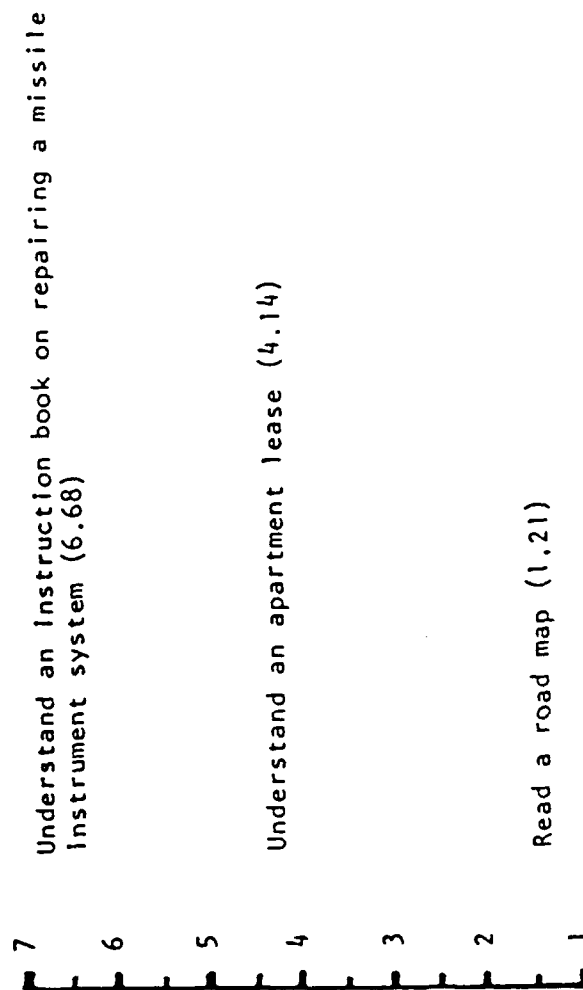


1. ORAL COMPREHENSION: The ability to understand spoken English words and sentences.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

2. WRITTEN COMPREHENSION: The ability to understand written sentences and paragraphs.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

3. ORAL EXPRESSION: The ability to use English words or sentences in speaking so others will understand.

7  
6  
5  
4  
3  
2  
1

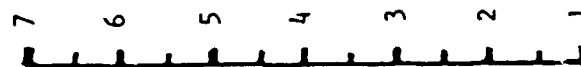
Give a talk on a technical subject before a professional society using new concept (6.24)

Give directions to a motorist so that he can reach his destination (3.76)

Cancel newspaper delivery by phone (1.69)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

4. WRITTEN EXPRESSION: The ability to use English words or sentences in writing so others will understand.



Write an instruction book for computer systems (6.84)

Write a job recommendation for a subordinate (3.76)

Write a note to remind someone to take something out of the freezer (1.13)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

5 MEMORIZATION: The ability to remember information, such as words, numbers, pictures and procedures. Pieces of information can be remembered by themselves or with other pieces of information.

7  
6  
5  
4  
3  
2  
1

Memorize the Gettysburg address after studying it  
for 15 minutes (5.86)

Memorize the pledge to the flag (2.55)

Memorize the number on your bus to be sure that you  
get back to the right one (1.18)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

6. PROBLEM SENSITIVITY: The ability to tell when something is wrong or is likely to go wrong. It includes being able to identify the whole problem as well as the elements of the problem.



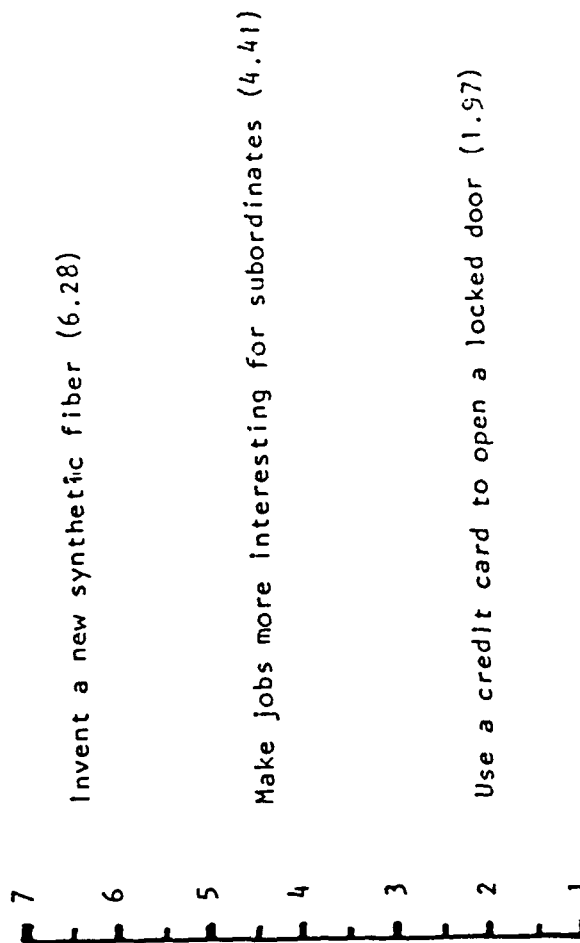
Recognize an illness at an early stage of a disease when there are only a few symptoms (5.62)

Recognize from the mood of prisoners that a riot is about to occur (3.86)

Recognize that an unplugged lamp won't work (1.31)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

7. ORIGINALITY: The ability to produce unusual or clever ideas about a given topic or situation.  
 It is the ability to invent creative solutions to problems or develop new procedures to situations in which standard procedures do not apply.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

8. INDUCTIVE REASONING: The ability to combine separate pieces of information, or specific answers to problems, to form general rules or conclusions. It involves the ability to think of possible reasons for why things go together.



Diagnose a disease utilizing knowledge from many lab tests (5.03)

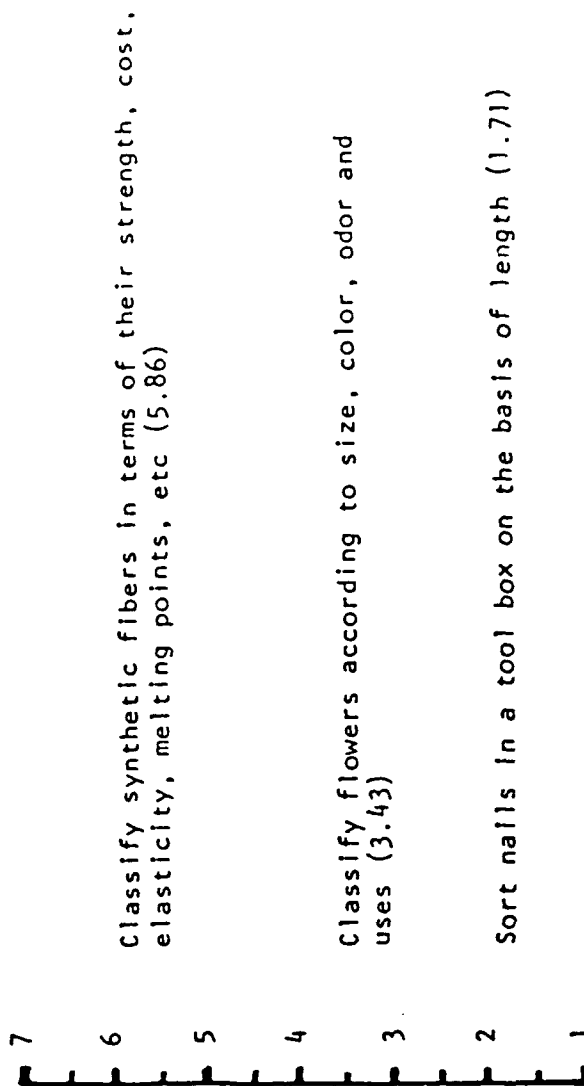
Interpret a weather chart (3.52)

Order a seafood platter at a restaurant to determine whether or not you like seafood (1.79)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

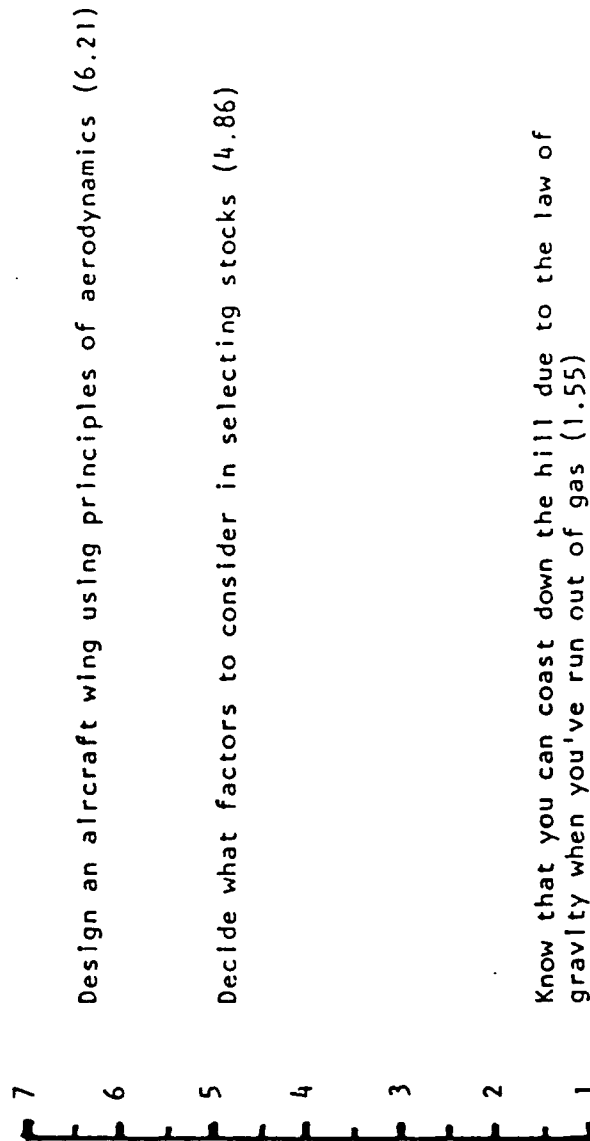


9. CATEGORY FLEXIBILITY: The ability to produce many rules so that each rule tells how to group a set of things in a different way. Each different group must contain at least two things from the original set of things.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

10. DEDUCTIVE REASONING: The ability to apply general rules to specific problems to come up with logical answers. It involves deciding if an answer makes sense.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

11. INFORMATION ORDERING: The ability to follow correctly a rule or set of rules to arrange things or actions in a certain order. The rule or set of rules used must be given. The things or actions to be put in order can include numbers, letters, words, pictures, procedures, sentences, and mathematical or logical operations.



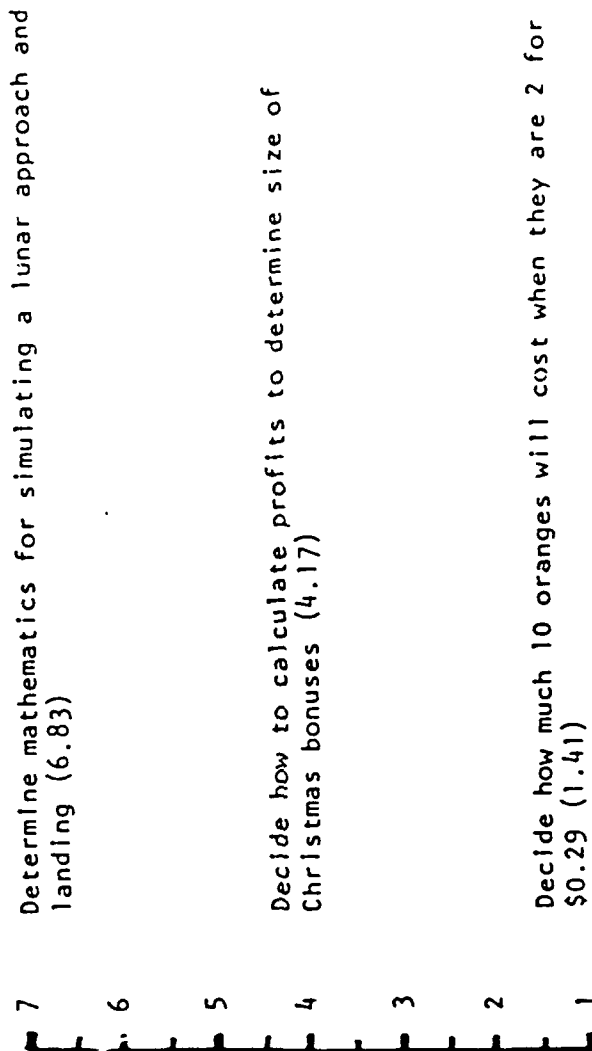
Determine the appropriate sequence of checkout procedures for the Apollo rocket (6.75)

Arrange five sentences into a paragraph that makes sense (3.21)

Put things in numerical order (1.32)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

12. MATHEMATICAL REASONING: The ability to understand and organize a problem and then select a mathematical method or formula to solve the problem. It encompasses reasoning through mathematical problems to determine appropriate operations that can be performed to solve problems. It also includes the understanding or structuring of mathematical problems. The actual manipulation of numbers is not included in this ability.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

13. NUMBER FACILITY: Involves the degree to which adding, subtracting, multiplying, and dividing can be done quickly and correctly. These can be steps in other operations like finding percentages and taking square roots.



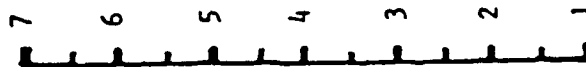
Computer interest payment which should be generated from investment (4.59)

Reconcile checking account monthly statement (2.72)

Add 2 and 7 (1.03)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

14. FLUENCY OF IDEAS: The ability to produce a number of ideas about a given topic.



Name all possible problems that might occur with  
a space launch (6.59)

Think of as many new ideas as possible for the name of  
a new research firm (3.59)

Name four brands of toothpaste (1.66)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

15. TIME SHARING: The ability to shift back and forth between two or more sources of information.



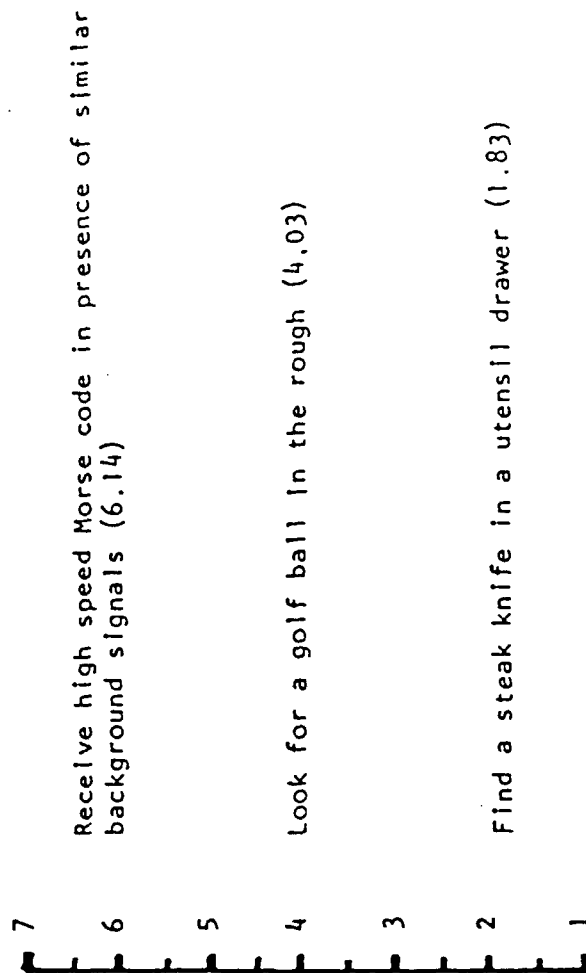
Keep track of all inbound and outbound planes during a period of heavy traffic (6.07)

Monitor several teletypes at the same time in a newsroom (4.76)

Watch streetsigns and road while driving 30 miles per hour (3.31)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

16. FLEXIBILITY OF CLOSURE: The ability to identify or detect a known pattern (like a figure, word or object) that is hidden in other material. The task is to pick out the disguised pattern from the background material.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.



17. SPEED OF CLOSURE: Involves the degree to which different pieces of information can be combined and organized into one meaningful pattern quickly. It is not known beforehand what the pattern will be. The material may be visual or auditory.



Interpret the patterns on the weather radar to decide if the weather is changing (5.14)

Find five camouflaged birds in a picture (4.41)

While listening to the radio, recognize and start to hum an old song after hearing only the first few lines (2.69)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

18. SELECTIVE ATTENTION: The ability to concentrate on a task one is doing. This ability involves concentrating while performing a boring task and not being distracted.



Study for a math exam in a house of noisy, young children (5.45)

Listen to a news broadcast during a dinner conversation (4.10)

Have a conversation with a friend at a noisy cocktail party (2.69)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

19. PERCEPTUAL SPEED AND ACCURACY: Involves the degree to which one can compare letters, numbers, objects, pictures or patterns, quickly and accurately. The things to be compared may be presented at the same time or one after the other. This ability also includes comparing a presented object with a remembered object.



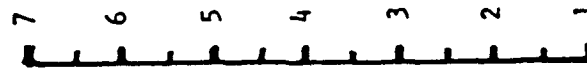
Inspect assembled electrical components for defects as they flow by on a fastmoving line (5.31)

Read 5 temperature gauges in 30 seconds to insure temperature is within safe limits (4.04)

Scan the list of batting records in Sunday sports section to see who scored the most runs (2.35)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

20. SPATIAL ORIENTATION: The ability to tell where you are in relation to the location of some object or to tell where the object is in relation to you.



Be aware of your orientation upon awakening in a gravity-free environment, like a space craft (5.71)

While lost in a rural area, locate your position on a road map (4.32)

Find your way through a familiar room when lights are out without bumping into anything (3.36)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

21. NEAR VISION: The capacity to see close environmental surroundings.



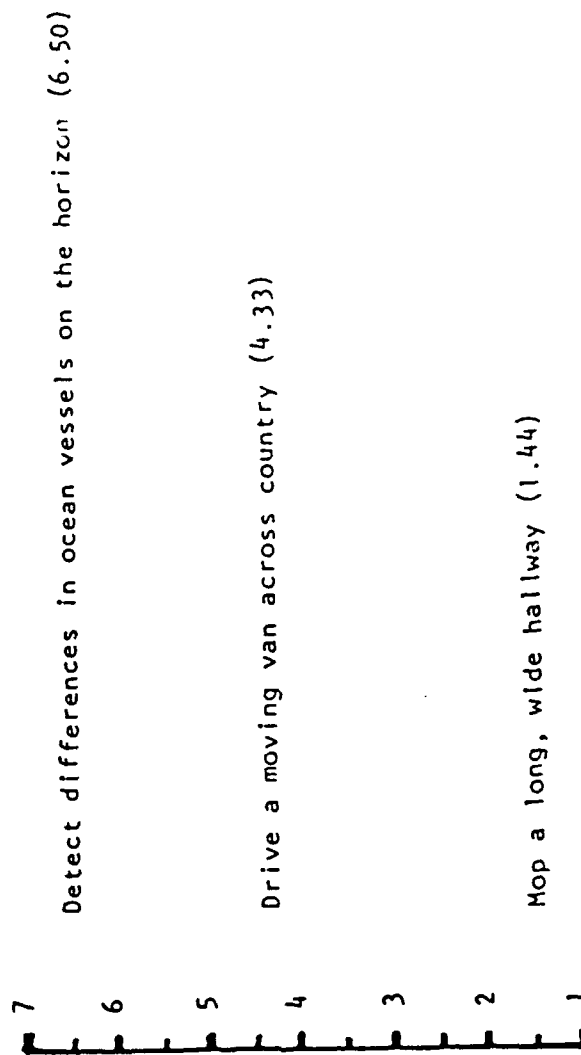
Read the fine print of legal journals (5.89)

Cut and mount color film transparencies (4.67)

Plug in a TV set (1.44)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

22. FAR VISION: The capacity to see distant environmental surroundings.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

23. NIGHT VISION: The ability to see under low light conditions.



Catch lightning bugs on a summer evening (5.41)

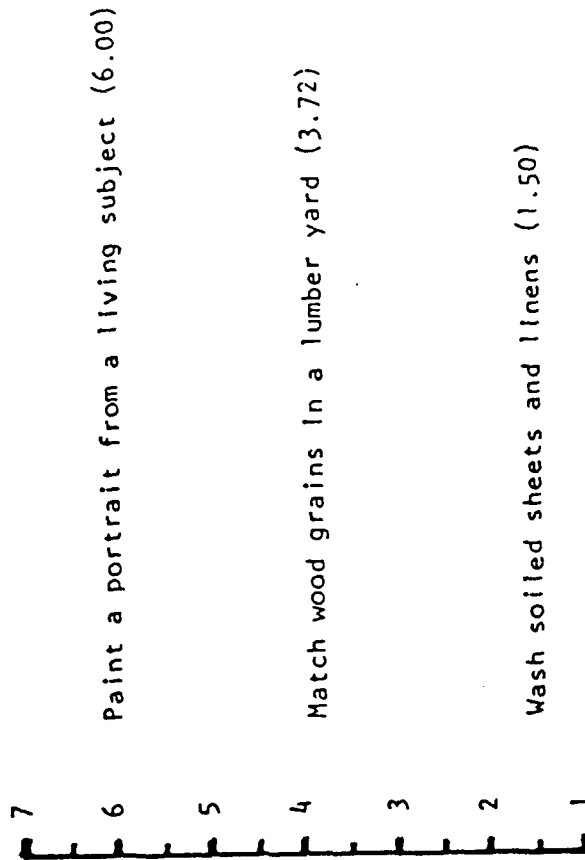
Take notes during a slide presentation (4.33)

Examine the positions of pieces on a chessboard (2.89)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

24. VISUAL COLOR DISCRIMINATION:

The capacity to match or discriminate between colors. This capacity also includes detecting differences in color purity (saturations) and brightness (brilliance).



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.



25. PERIPHERAL VISION: The ability to perceive objects or movement towards the edges of the visual field.



- Monitor the instrument panel of a jet aircraft (4.44)
- Monitor opponent's position while returning tennis serve (3.89)
- Transcribe handwritten notes into formal record sheets (3.15)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

26. DEPTH PERCEPTION: The ability to distinguish which of several objects is more distant from or nearer to the observer, or to judge the distance of an object from the observer.



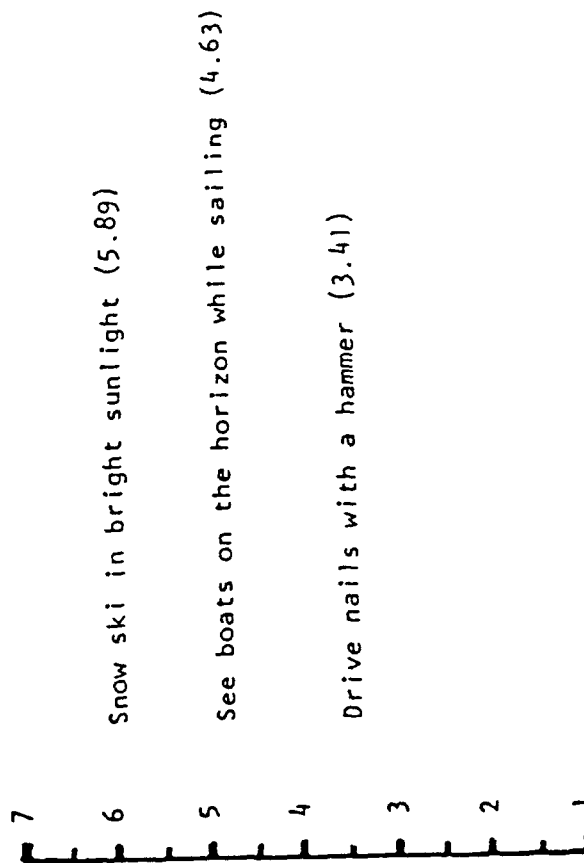
Thread a needle (5.37)

Operate a construction crane (4.15)

Judge which of two distant buildings is closer (3.04)

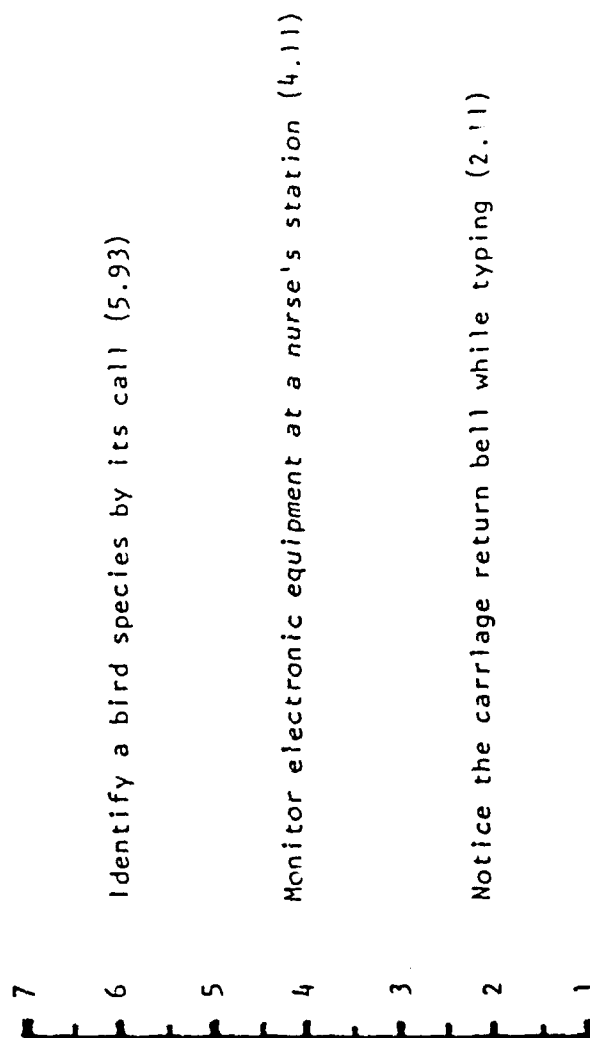
HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

27. GLARE SENSITIVITY: The ability to see objects in the presence of glare or bright ambient lighting.



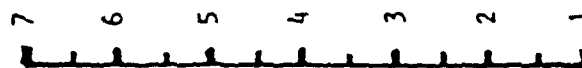
HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

28. GENERAL HEARING: The ability to detect and to discriminate among sounds that vary over broad ranges of pitch and/or loudness.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

29. AUDITORY ATTENTION: The ability to focus on a single course of auditory information in the presence of other distracting and irrelevant auditory stimuli.



Receive Morse code in a noisy radio room (6.04)

Listen for your flight announcement at an airport (4.70)

Locate someone calling you in a heavily wooded area (2.30)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

30. SOUND LOCALIZATION: The ability to identify the direction from which an auditory stimulus originated relative to the observer.



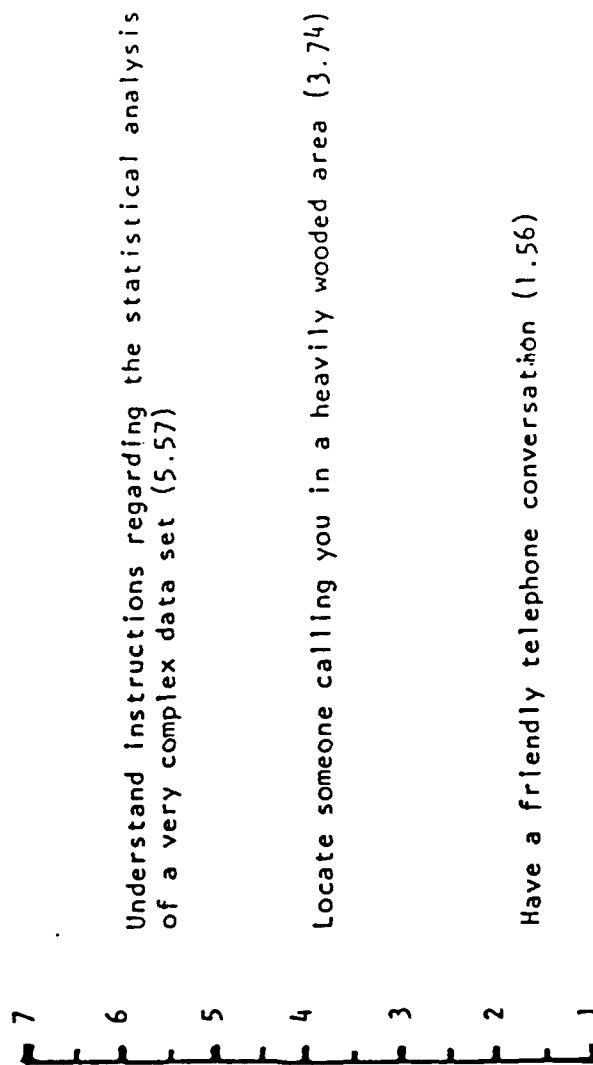
Locate someone calling your name in the midst of a crowd (5.15)

Find a ringing telephone in an unfamiliar apartment (3.70)

Take legal dictation (2.74)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

31. SPEECH HEARING: The ability to learn and understand the speech of another person.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

32. SPEECH CLARITY: The ability to communicate orally in a clear fashion understandable to a listener.



Present a financial status report to an executive board (5.52)

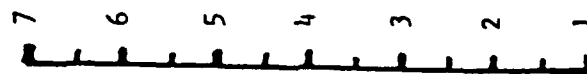
Discuss a news item with a friend (3.59)

Call the numbers in a bingo game (1.56)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.



33. VISUALIZATION: The ability to imagine how something will look when it is moved around or when its parts are moved or rearranged. It requires the forming of mental images of how patterns or objects would look after certain changes, such as unfolding or rotation. One has to predict how an object, set of objects, or pattern will appear after the changes are carried out.



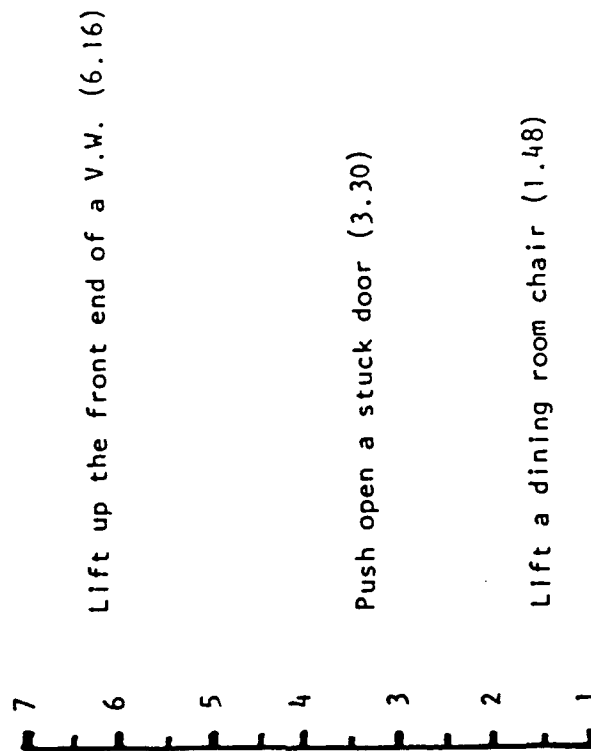
Anticipate your opponent's as well as your own future moves in a chess game (6.00)

Know how to cut and fold a piece of paper to make a cube (4.21)

Imagine how to put paper in the typewriter so the letterhead comes out at the top (1.46)

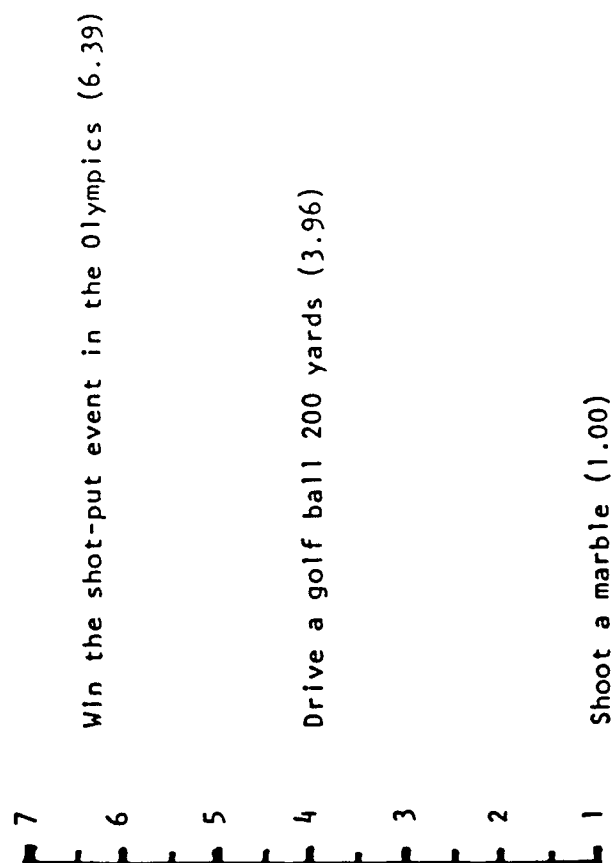
HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

34. STATIC STRENGTH: The ability to use muscle force in order to lift, push, pull, or carry objects.  
It is the maximum force that one can exert for a brief period of time.



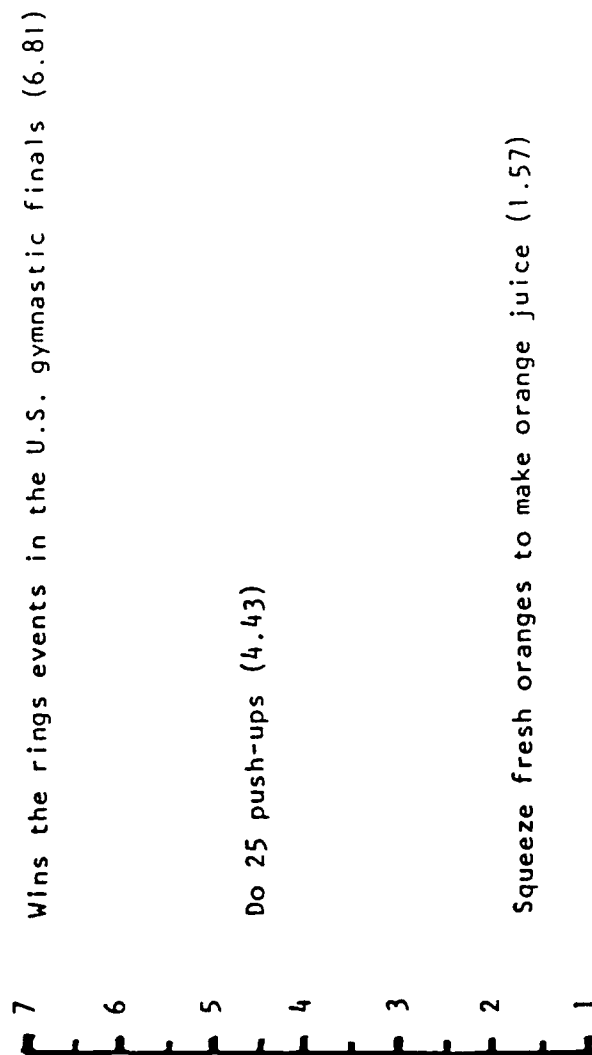
HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

35. EXPLOSIVE STRENGTH: The ability to use short bursts of muscle force to propel oneself or an object. It requires gathering energy for bursts of muscle effort over a very short time period.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

36. DYNAMIC STRENGTH: The ability of the muscles to exert force repeatedly or continuously over a long time period. This is the ability to support, hold up, or move the body's own weight and/or objects repeatedly over time. It represents muscular endurance and emphasizes the resistance of the muscles to fatigue.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

37. MUSCLE STRENGTH: Involves the degree to which one's stomach and lower back muscles can support part of the body repeatedly or continuously over time. The ability involves the degree to which these trunk muscles do not fatigue when they are put under repeated or continuous strain.



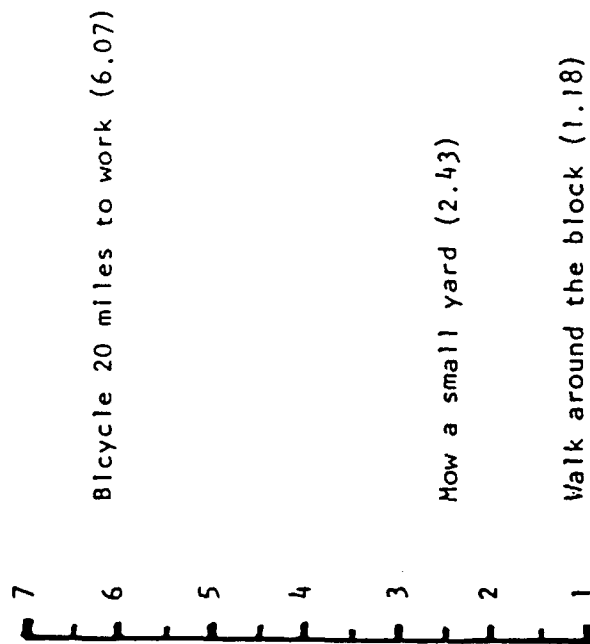
Do 100 sit-ups (6.46)

While lying on one's back, raise the legs off the floor for 5 seconds, repeat 10 times (4.57)

Sit up in a reclining chair (2.32)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

38. STAMINA: The ability of the lungs and circulatory systems of the body to perform efficiently over long time periods. This is the ability to exert oneself physically without getting out of breath.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

39. EXTENT FLEXIBILITY: The ability to bend, stretch, twist, or reach out with the body, arms, or legs.



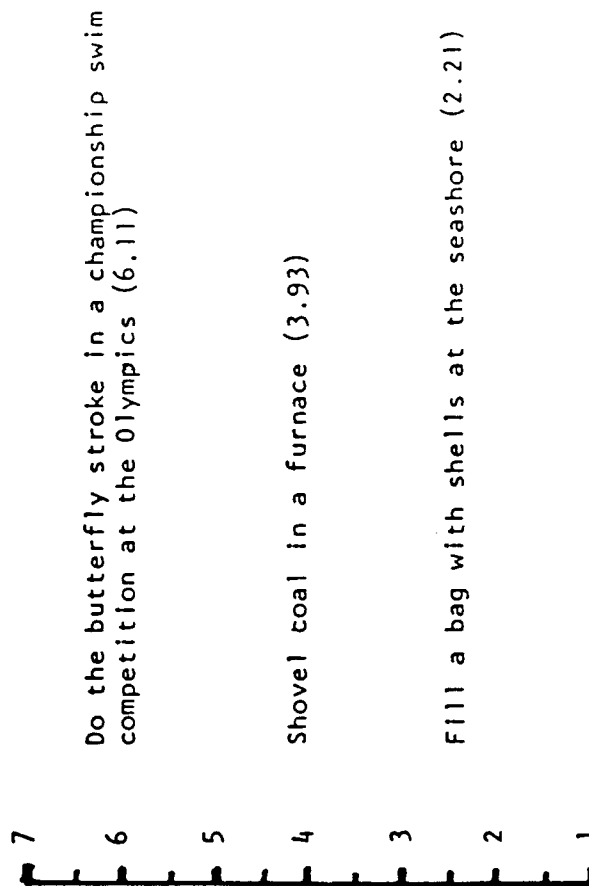
Win a limbo championship (6.04)

Reach out for something on the top shelf (3.46)

Reach for a soda in the back of a refrigerator (2.00)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

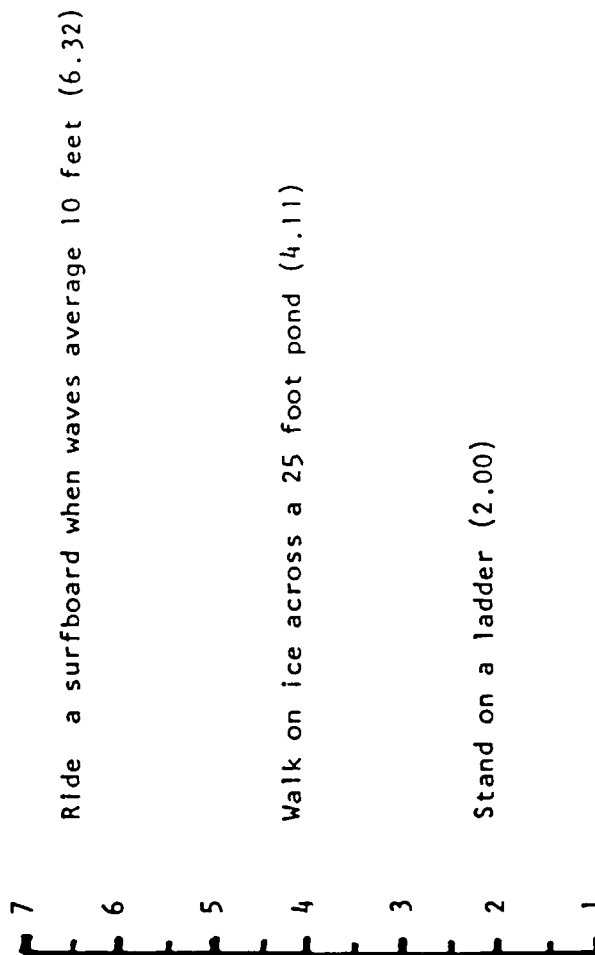
40. DYNAMIC FLEXIBILITY: The ability to bend, stretch, twist, or reach out with the body, arms and/or legs, both quickly and repeatedly.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.



41. CROSS BODY EQUILBIUM: The ability to keep or regain one's body balance or to stay upright when in an unstable position. This ability includes maintaining one's balance when changing direction while moving or standing motionless.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

42. SPEED OF LIMB MOVEMENT: Involves the speed with which a single movement of the arms or legs can be made. This ability does not include accuracy, careful control, or coordination of movement.



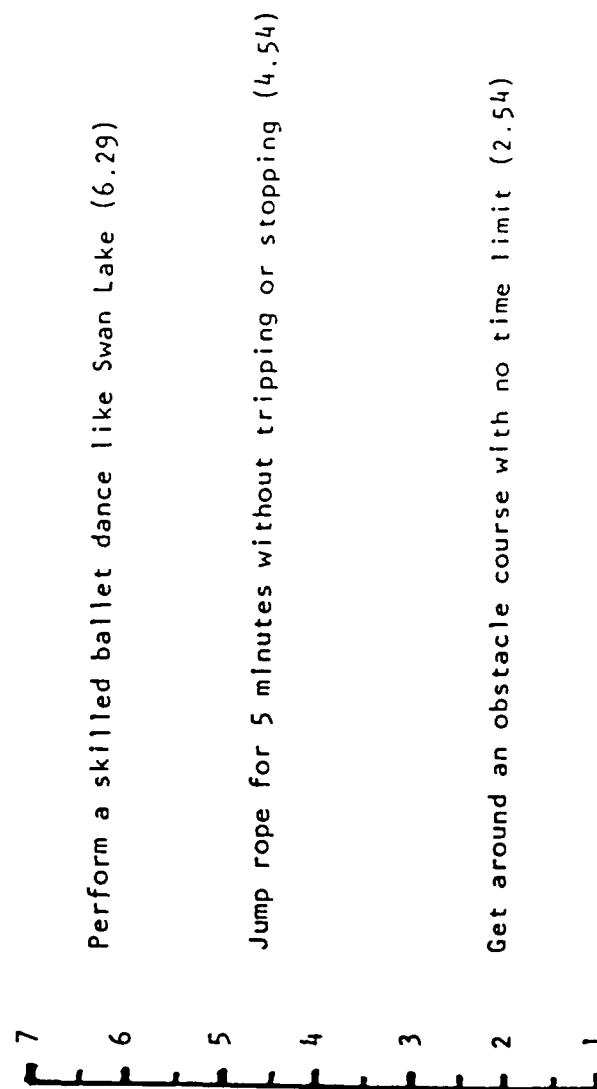
Play the bongo drums in a band (5.52)

Swat a fly with a fly swatter (4.21)

Saw through a thin piece of wood (2.28)

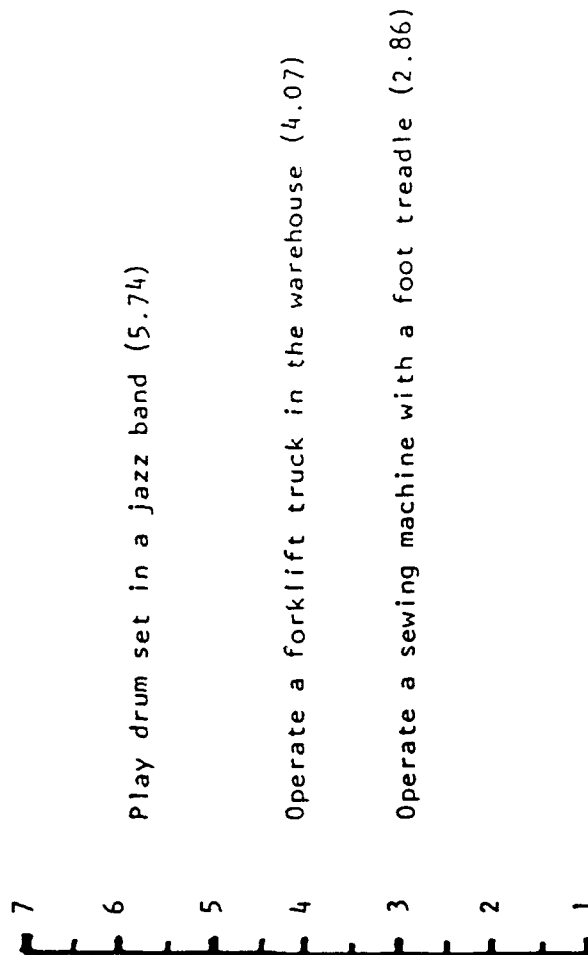
HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

43. GROSS BODY COORDINATION: The ability to coordinate the movement of the arms, legs, and torso together in activities in which the whole body is in motion,



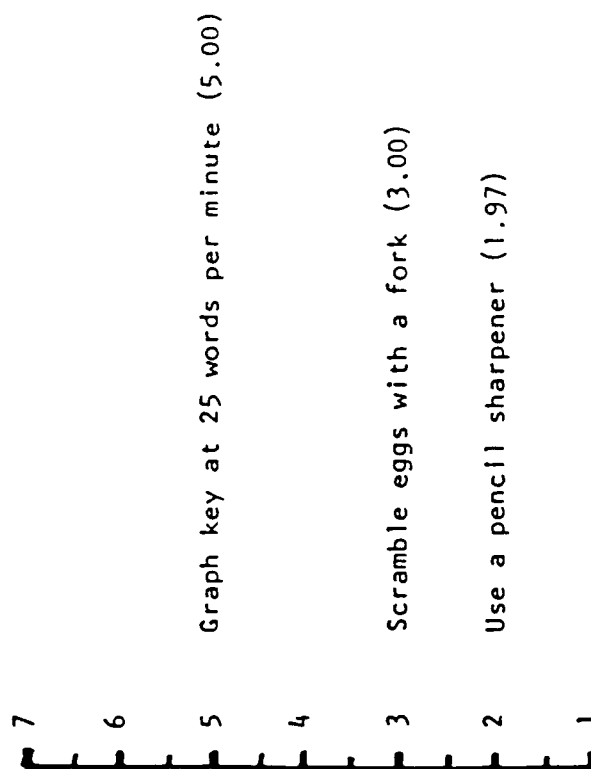
HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

44. MULTI-LIMB COORDINATION: The ability to coordinate movements of two or more limbs (for example, two arms, two legs, or one leg and one arm), such as in moving equipment controls. Two or more limbs are in motion while the individual is sitting, standing, or lying down.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

45. WRIST-FINGER SPEED: The ability to make fast, simple repeated movements of the fingers, hands, and wrists. It involves little, if any, accuracy or eye-hand coordination.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

46. FINGER DEXTERITY: The ability to make skillful, coordinated movements of the fingers of one or both hands and to grasp, place, or move small objects. This ability involves the degree to which these finger movements can be carried out quickly.



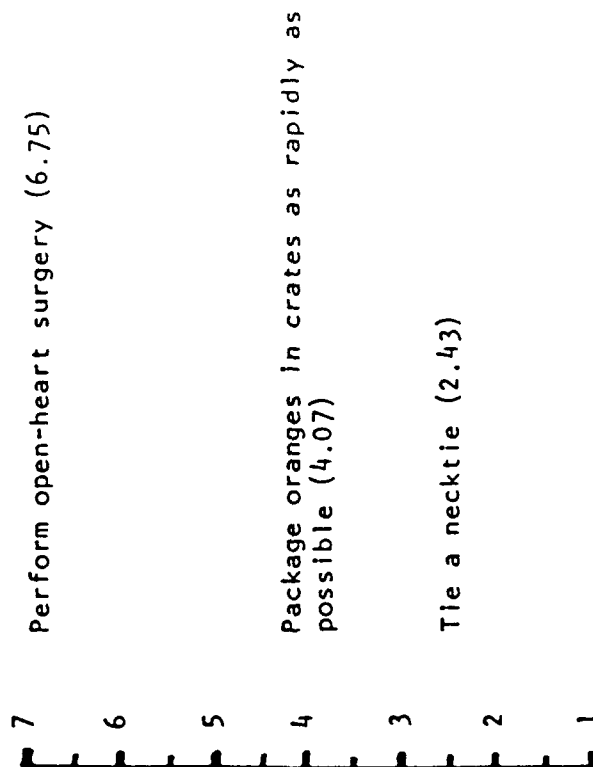
Play a classical flamenco piece on the guitar (5.79)

Untie a knot in a long-awaited package (3.54)

Put coins in a parking meter (1.46)

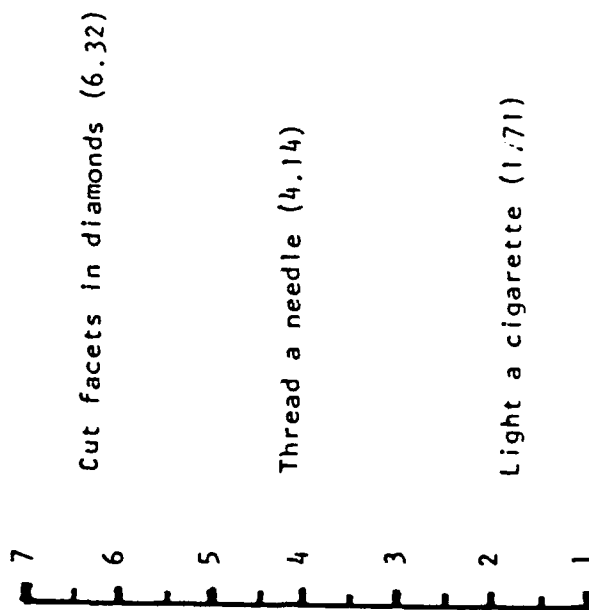
HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

47. MANUAL DEXTERITY: The ability to make skillful coordinated movements of one hand, a hand together with its arm, or two hands to grasp, place, move, or assemble objects like hand tools or blocks. This ability involves the degree to which these arm-hand movements can be carried out quickly. It does not involve moving machine or equipment controls like levers.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

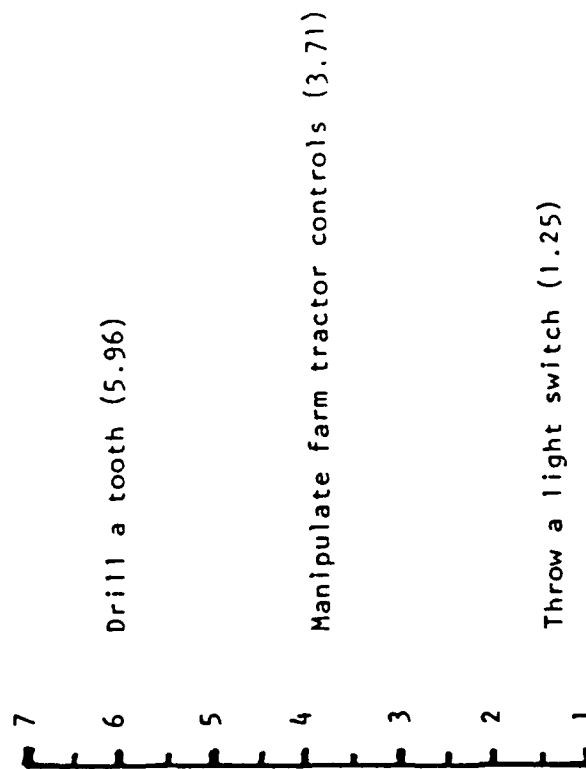
48. ARM-HAND STEADINESS: The ability to keep the hand and arm steady. It includes steadiness while making an arm movement as well as while holding the arm and hand in one position. This ability does not involve strength or speed.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

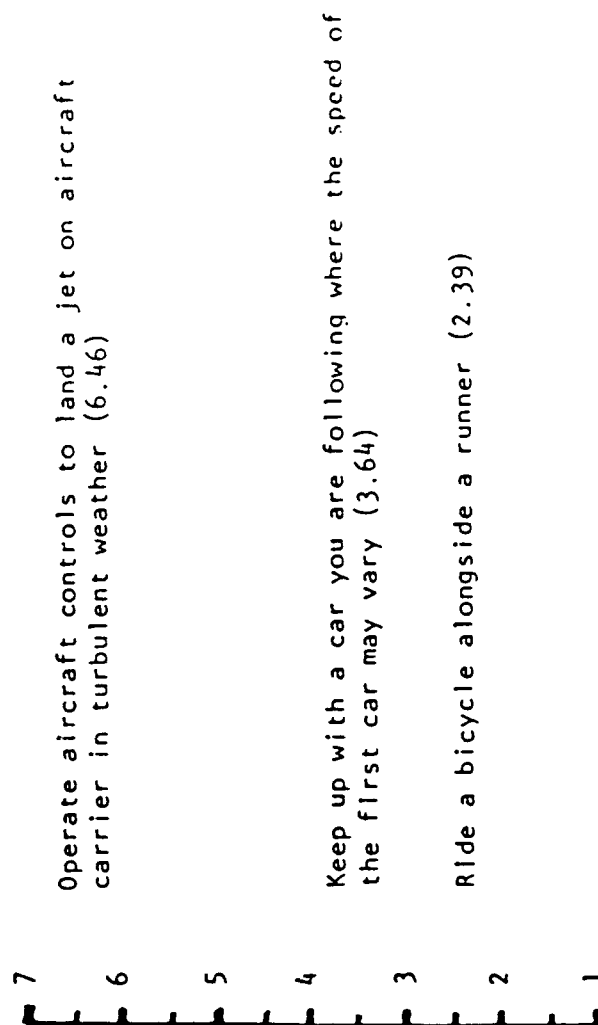


49. CONTROL PRECISION: The ability to move controls of a machine or vehicle. This involves the degree to which these controls can be moved quickly and repeatedly to exact positions.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

50. RATE CONTROL: The ability to adjust an equipment control in response to changes in the speed and/or directions of a continuously moving object or scene. The ability does not extend to situations in which the speed and direction of the object are perfectly predictable.



HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

51. REACTION TIME: The ability to give one fast response to one signal (sound, light, picture) when it appears. This ability is concerned with the speed with which the movement can be started with the hand, foot, or other parts of the body.



- Hit back the ball which has been slammed at you in a ping-pong game (5.48)
- Duck to miss being hit by a snowball thrown from across the street (3.62)
- Start to apply brakes on your car 1-second after the light turns red (2.28)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

52. CHOICE REACTION TIME: The ability to choose between two or more movements quickly and accurately when two or more different signals (lights, sounds, pictures) are given. The ability is concerned with the speed with which the right response can be started with the hand, foot, or other parts of the body.



In a spacecraft out of control, quickly choose one of 5 possible corrections in 0.7 seconds (6.52)

Operate a busy switchboard where you must plug calls in and out quickly and accurately every few seconds (4.83)

When a doorbell and telephone ring simultaneously, select one to answer first in one second (2.93)

HOW MUCH OF THIS ABILITY IS NEEDED FOR THIS JOB OR TASK? Put your number on the answer sheet.

Appendix C  
Job Descriptions, MOS 97E and MOS 96H

# Job Description: INTERROGATOR (MOS 97E)

An Interrogator conducts foreign-language interrogations of enemy prisoners of war, enemy deserters or defectors, insurgents, refugees, informers, and other civilians from enemy areas to get information necessary for developing military intelligence. He then prepares reports based on these interrogations. To gauge the truth of the information he gets, he compares it with other interrogation reports, captured documents, intelligence reports, and other relevant information.

An Interrogator translates written foreign language material into English and prepares summaries, extracts, or full translations, as needed. He translates foreign documents such as combat orders, directives, records, and messages to get intelligence information. He translates foreign technical material to get information about the construction, operation, maintenance, employment, and characteristics of foreign military equipment.

An Interrogator must recognize valuable information when he finds it. Interrogations may be tactical or strategic in nature and scope. An Interrogator must know the current tactical and strategic situation, the commander's plans, and the intelligence requirements of the command. An Interrogator needs ready access to intelligence and interrogation files, and to interrogation aids such as order of battle files, maps gazetteers, city plans, aerial photos, and recognition handbooks on weapons, vehicles, equipment, aircraft, uniforms and insignia, etc.

An Interrogator develops and prepares an interrogation plan, including the objective and an approach strategy which takes into account the physical condition, behavior, attitudes, and emotions of the person being interrogated, as well as the interrogator's strengths and limitations and the time constraints on the interrogation. The Interrogator also decides how to record information, by hand-written note or by recording equipment, weighing factors such as accuracy, feasibility, and time required. The Interrogator also decides whether or not to use an interpreter and if the interpretation should be simultaneous or sequential. The Interrogator must be able to carry out his chosen strategy, change his approach when necessary, and terminate the interrogation when the objectives have been achieved, when the source or the interrogator himself is physically or mentally unable to continue, or when the Interrogator is no longer in control of the interrogation. During the interrogation, the Interrogator seeks to gain the source's cooperation and to recognize and exploit opportunities to get useful intelligence information.

An Interrogator uses maps and the information they provide at each stage of an interrogation, in planning, conducting, and documenting an interrogation. He understands topographic symbols and color codes (black, blue, brown, green, red). He converts coordinates and azimuths, uses intersections or resections to locate unknown points, and prepares situation maps and overlays. If a source is unable to read a map, the Interrogator explains needed concepts to obtain location data.

An Interrogator translates announcements, speeches, etc. for presentation to non-English speakers and serves as an interpreter as needed.

# **Job Description: AERIAL INTELLIGENCE SPECIALIST (MOS 96H)**

An Aerial Intelligence Specialist helps to plan and carry out aerial surveillance, aerial visual reconnaissance, aerial search and rescue, aerial radiological survey, and similar intelligence and information gathering missions. To perform aerial missions he uses his visual acquisition skills and operates manned aerial infrared, radar, photographic, or similar sensor systems and associated data transmission links and ground data terminal stations. He operates the radio and aids in aerial navigation.

An Aerial Intelligence Specialist acquires targets visually and also interprets target signatures that appear on near-real-time sensor system displays. He gives in-flight spot reports on targets of opportunity. He recognizes enemy electronic countermeasures directed at aircraft or ground component communications or sensor system equipment. If there are appropriate electronic countermeasures, he carries them out.

When the mission is over, the Aerial Intelligence Specialist takes part in the debriefing of the mission and helps the Imagery Analyst to interpret the imagery recordings.

In addition to his operational tasks, the Aerial Intelligence Specialist does the preoperation and postoperation operator and unit maintenance on assigned sensor, SERE (survival, evasion, resistance, and escape), and associated equipment. He troubleshoots sensor and associated systems to determine the nature and location of faults that occur; he removes and replaces defective components. He records operation and maintenance data in an equipment log.

To illustrate more specifically the type and range of tasks the Aerial Intelligence Specialist performs, a mission will be described in greater detail:

An Aerial Intelligence Specialist is going to carry out an aerial surveillance mission to collect intelligence data on enemy troop deployments. In planning the mission, he selects mission maps covering the target areas and the approach routes to and from the target. Using the mission maps and other available documents, he evaluates terrain characteristics in the target areas, determines what sensor settings (antenna selection, range range delay) are appropriate to satisfy mission requirements, and plots the proposed radar coverage on the mission map. All enemy antiaircraft artillery sites, surface-to-air missile sites, and airfields capable of posing a threat are located. Capabilities and limitations of deployed enemy air defense threat equipment are determined and the situation map is updated to reflect risks to mission aircraft.

The Aerial Intelligence Specialist helps the pilot plan the flight, including analyzing weather conditions, scheduling the flight, and doing navigational computations. He determines the coordinates of the target boundaries to six digits. He plots flight routes, determines the magnetic course to within 2 degrees for each flight route, enters the headings on the maps, and calculates flight time and distance. He determines radio call signs and frequencies for coordination, control, and support activities.

## Job Description: 96H (continued)

The Aerial Intelligence Specialist performs preoperational checks on the aerial surveillance equipment, the side-looking airborne radar (SLAR), the infrared detecting set, and the photographic camera systems. As part of the preoperational check on the SLAR system, he goes through an 11-step preventive maintenance check, inspecting equipment components to see that they latches, and fasteners to be sure they are working, inspecting SLAR components to see that they are present, properly and securely mounted, and connected. He checks cables for cracks or breaks and electrical and waveguide connectors for tightness. He compares the color of the waveguide pump desiccant with the desiccant indicator color key to see if it is still effective. He repairs and replaces components as needed.

If, for example, the waveguide pump needs replacing, he disconnects the waveguide connectors, checking each connector to be sure it is properly tagged. He disconnects the cable connectors from the encoder front panel and from the UHF receiver/transmitter front panel. He removes the disconnect pins from the pallet retaining brackets and slides the pallet out far enough that he can reach the waveguide pump. He disconnects the cable connector from the waveguide pump, opens the vent valve, and disconnects the air hose connector. With help from another soldier, he slides the pallet out of the equipment compartment. He then removes and replaces the waveguide pump and the interconnecting box. Again with help he aligns the pallet on the pallet track and slides it back into the equipment compartment. He connects the air hose and cable connectors and closes the vent valve. He inserts the disconnect pins in the pallet-retaining brackets, reconnects the UHF receiver/transmitter and encoder cables, and closes the equipment compartment door. Similar procedures cover the removal and replacement of other SLAR components, the signal processor, the receiver/transmitter, the power supply, cockpit complex components, etc.

Once he completes the preoperational check, the Aerial Intelligence Specialist begins the preliminary starting procedures and preflight checks. He sets 13 radar controls and 7 recorder controls at preliminary values. He connects an auxiliary power supply unit to the aircraft, starts the unit, and checks the cockpit indicator to verify that the operating voltage is 28 VDC  $\pm$  4V. The preflight starting procedures include inserting coordinate data into the inertial guidance system and adjusting recorder panel and film illumination controls.

The Aerial Intelligence Specialist also checks to see that his survival-evasion-resistance-escape equipment is complete and ready for use. His ejection seat safety check has to be done without touching or moving any handles colored yellow or black. His ejection seat harness must be serviceable, his survival vest complete and in good condition, his emergency radio set serviceable, his .38 caliber revolver serviceable and loaded, and his life preserver and personal flight helmet must fit and be in good condition.

Before the preoperational check is complete, the Aerial Intelligence Specialist must adjust the SLAR monitor CRT, perform a BITE check, check the monitor display, perform two film speed accuracy tests, load the film in the recorder, and conduct a final operational test, inspecting a test pattern to ensure that 10 separate items appear.



### Job Description: 96H (continued)

Once airborne, the Aerial Intelligence Specialist carries out the inflight operations of the SLAR, monitoring system control settings throughout the mission to ensure that 100 percent of the target area is mapped. If any interference or jamming occurs, he identifies it by type and takes corrective action when appropriate. He operates the infrared detecting set to be sure that imagery is produced to meet the mission requirements. After checking 8 test points for a video waveform, he adjusts system controls for optimum target resolution, adjusts brightness, contrast, and focus, and continues to monitor the imagery as the flight progresses. He can adjust the marker threshold to raise or lower the level of the targets to be marked. He adjusts the IR filter in keeping with mission requirements. Utilizing size, shape, shadow, surroundings, and tone, he identifies targets that appear on the terrain display indicator. He then plots them on the mission map to within  $\pm 100$  meters and records them on the mission log. He also operates the camera systems to ensure photos of all the targets in the designated target area.

The Aerial Intelligence Specialist transmits inflight reports, encrypting report data if non-secure radio equipment is used, and maintains records on the mission log for debriefing purposes. He identifies items of military significance, including military equipment, and is alert for targets of opportunity. He operates the aircraft radios (UHF, VHF, HF-SSB, FM) so that voice radio communications are effective and maintained throughout the mission. He also operates the inertial navigation system while inflight.

At the end of the flight the Aerial Intelligence Specialist downloads the cameras, installs dust covers and lens caps, checks the IR equipment and removes the film magazine from the recorder, unloads all the film in the dark room, and labels each canister to identify the mission. He describes to a debriefer the results of the mission, the enemy activity observed, any damage that took place, the effect of weather, smoke, or other variables on the imagery obtained, and any other items of significance. After the images are processed, he helps the imagery analyst interpret the results of the mission.